IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.

This PHOTOFACT Folder Set is

WIRE-SEALED FOR YOUR PROTECTION

to guarantee completeness of contents

DO NOT ACCEPT IF SEAL HAS BEEN BROKEN

TO OPEN ***JUST DO THIS:***

1

Bend up the ends of the wire-seals using a screwdriver or similar instrument. Take hold of the Set with both hands. Place your thumbs directly under the top wire-seal; then, divide the contents equally by putting your thumbs midway through the thickness of the Set. Now, pull the two sections apart at the top.

2

Repeat this process, pulling close to the wire-seal at the bottom, so that the set is now divided into two equal parts.

3

Continue this "pulling-apart" process with the section in which the wire-seals remain, dividing it in half.

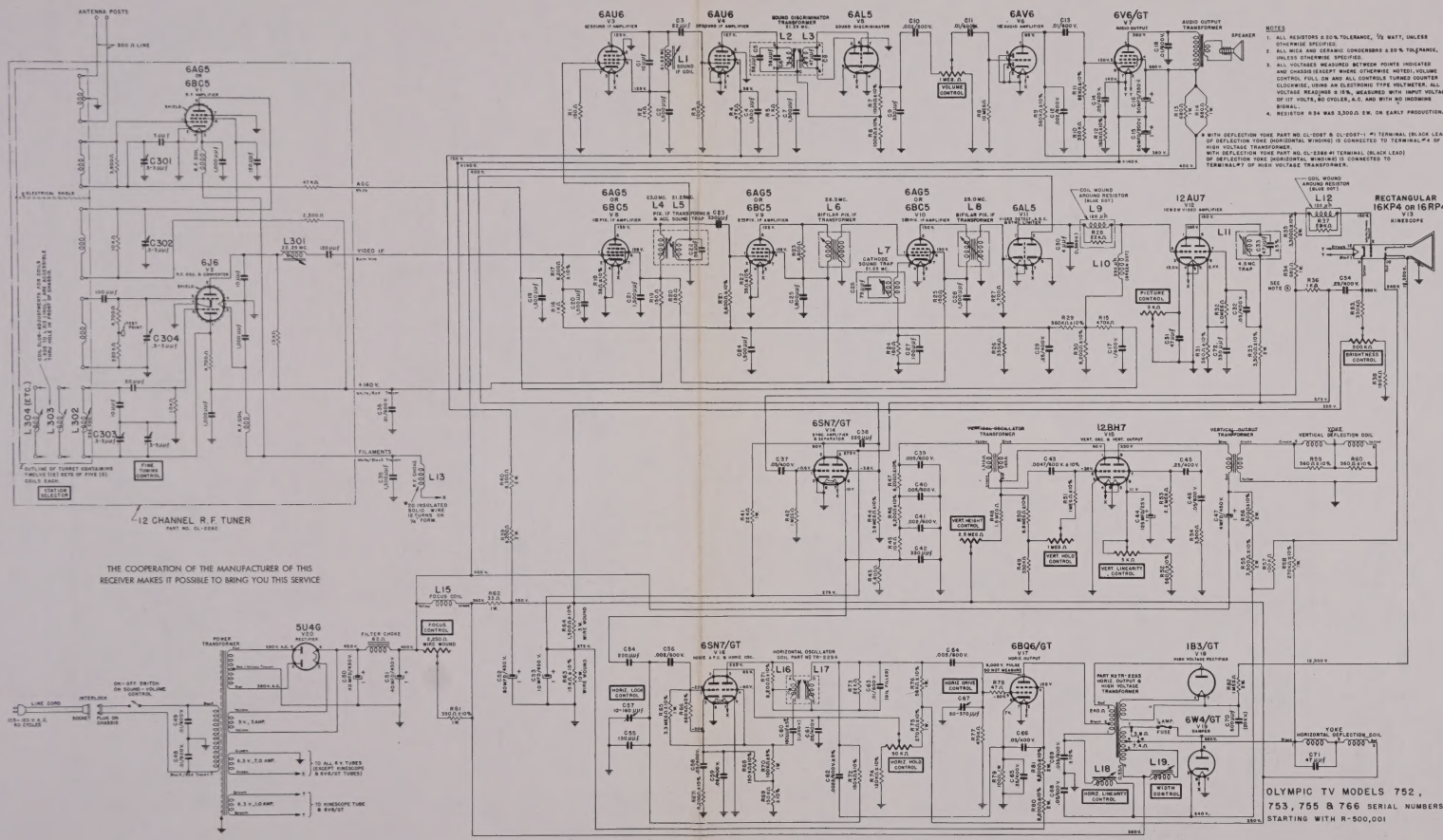
4

Finally, remove the wire-seals left in the last section; this can easily be done with your fingernail or any sharp instrument.

Your "Safety-Sealed" PHOTOFACT Set is now ready for profit-making use . . .

IMPORTANT

Before you remove the Wire-Seal, check the contents of this envelope with the listing on the front of the envelope. If any part is missing, your Howard W. Sams distributor will replace the entire PHOTOFACT set IF the Wire-Seal has not been damaged.


12 CHANNEL R.F. TUNER
PART NO. CL-2282
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
OLYMPIC TV MODELS 752, 753, 755 & 766 SERIAL NUMBERS STARTING WITH R-500,001

PRELIMINARY DATA
The data contained in this folder is published in advance of regular PHOTOFACT Coverage

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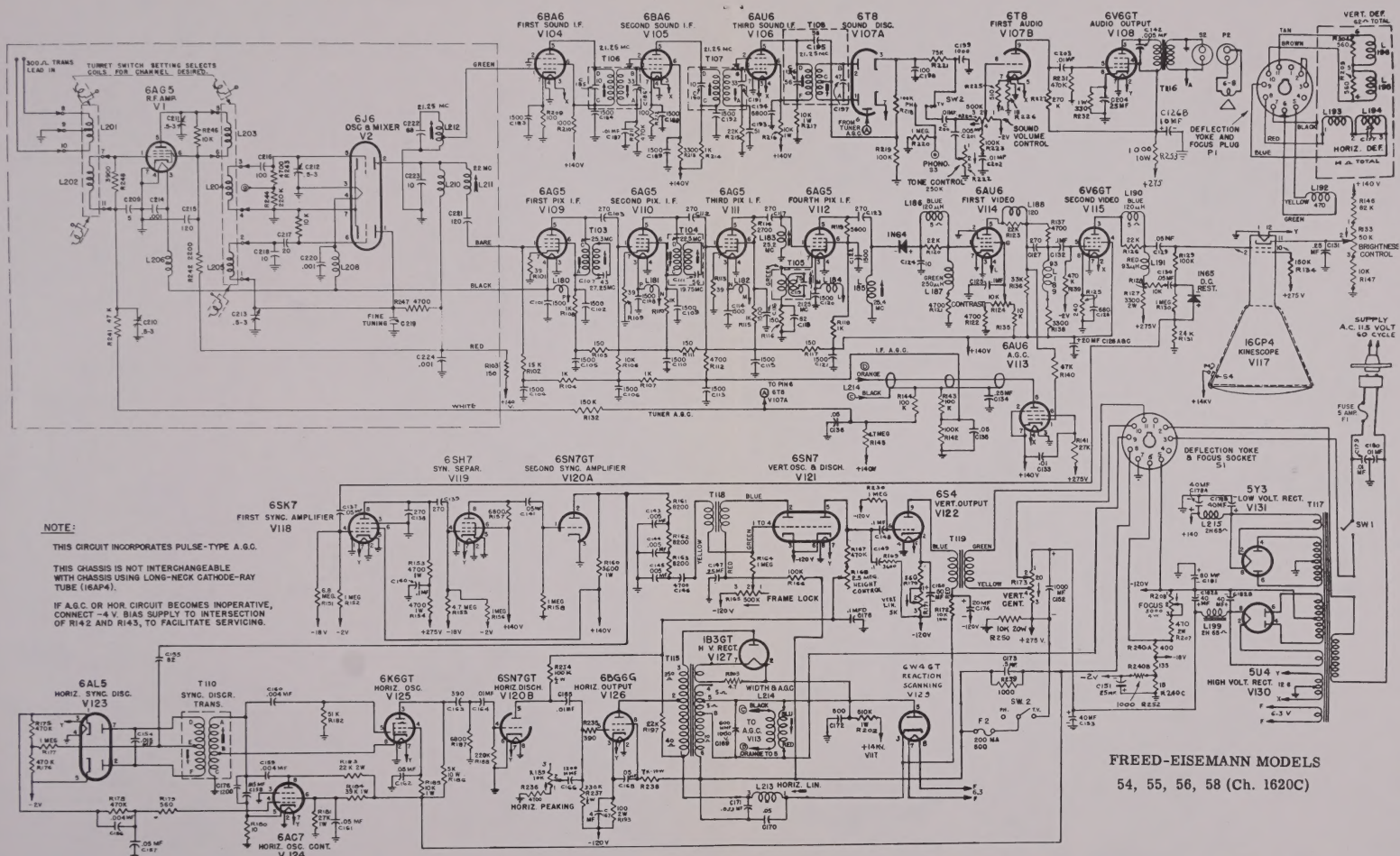

NOTE:
THIS CIRCUIT INCORPORATES PULSE-TYPE A.G.C.
THIS CHASSIS IS NOT INTERCHANGEABLE WITH CHASSIS USING LONG-NECK CATHODE-RAY TUBE (16AP4).
IF A.G.C. OR HOR. CIRCUIT BECOMES INOPERATIVE, CONNECT −4 V. BIAS SUPPLY TO INTERSECTION OF R142 AND R143, TO FACILITATE SERVICING.
6BA6 FIRST SOUND I.F. V104
6BA6 SECOND SOUND I.F. V105
6AU6 THIRD SOUND I.F. V106
6T8 SOUND DISC. V107A
6T8 FIRST AUDIO V107B
6V6GT AUDIO OUTPUT V108
6AG5 R.F. AMP. V1
6J6 OSC. & MIXER V2
6AG5 FIRST PIX. I.F. V109
6AG5 SECOND PIX. I.F. V110
6AG5 THIRD PIX I.F. V111
6AG5 FOURTH PIX I.F. V112
6AU6 FIRST VIDEO V114
6V6GT SECOND VIDEO V115
6AU6 A.G.C. V113
16GP4 KINESCOPE V117
6SH7 SYN. SEPAR. V119
6SN7GT SECOND SYNC. AMPLIFIER V120A
6SN7 VERT. OSC. & DISCH. V121
6SK7 FIRST SYNC. AMPLIFIER V118
6S4 VERT. OUTPUT V122
6AL5 HORIZ. SYNC. DISC. V123
6K6GT HORIZ. OSC. V125
6SN7GT HORIZ. DISCH V120B
6BG6G HORIZ. OUTPUT V126
6AC7 HORIZ. OSC. CONT. V 124
1B3GT H. V. RECT. V127
6W4GT REACTION SCANNING V123
5Y3 LOW VOLT. RECT. V131
5U4 HIGH VOLT. RECT. V130
FREED-EISEMANN MODELS
54, 55, 56, 58 (Ch. 1620C)

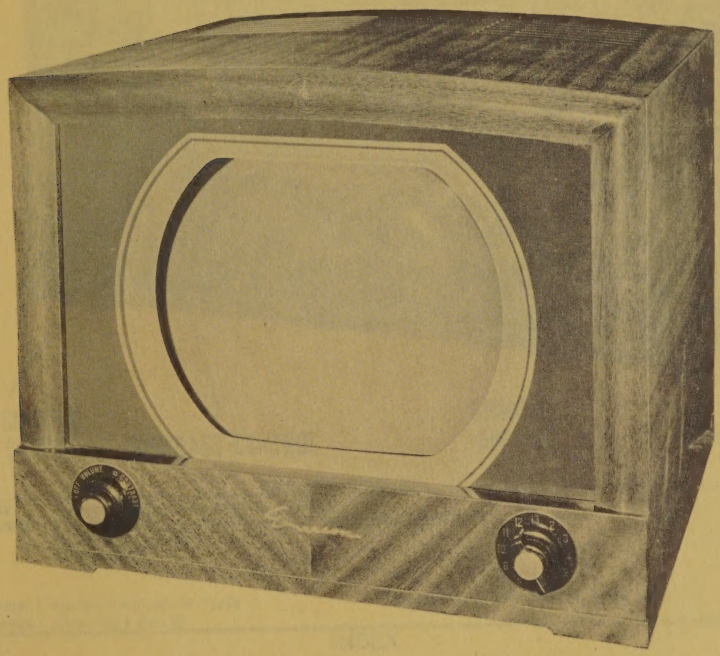
PHOTOFACT* Folder

EMERSON MODELS
650, 654 (CH. 120118B)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 650

EMERSON MODELS
650, 654 (CH. 120118B)

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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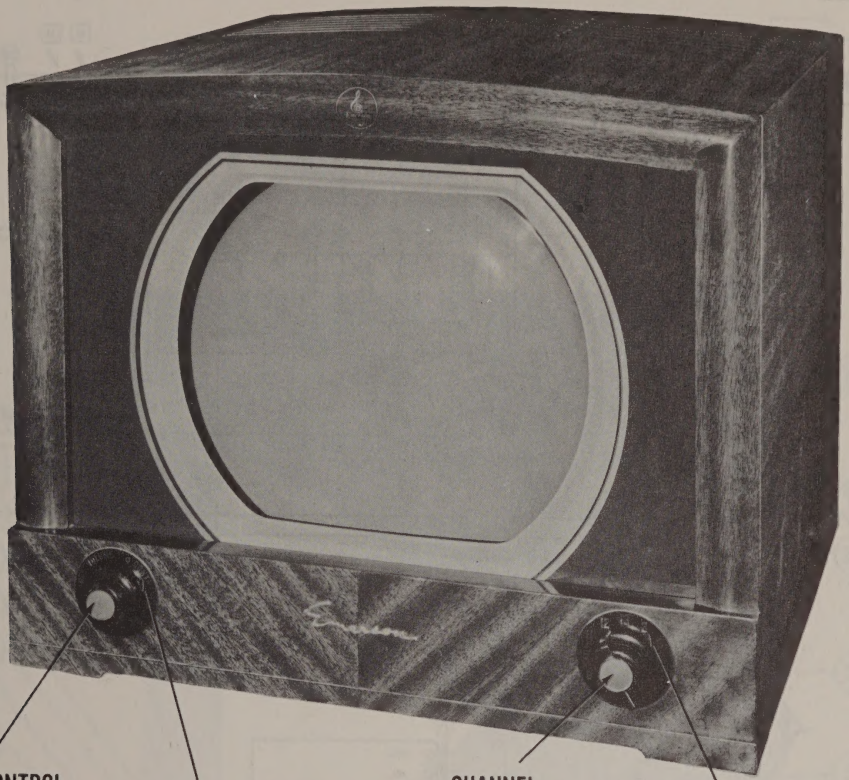
10 9 8 7 6 5 4 3 2 1

Date 11/50 Set No. 113—Folder No. 2



EMERSON MODELS
650, 654 (Ch. 120118B)

EMERSON MODEL 650

TRADE NAME	Emerson Models 650, 654 (Ch. 120118B)
MANUFACTURER	Emerson Radio and Phono Corp., 111 Eighth Ave., New York 11, New York
TYPE SET	Television Receiver
TUBES	Twenty One
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.5 Amp. at 117 Volts AC
TUNING RANGE–	Channels 2 thru 13

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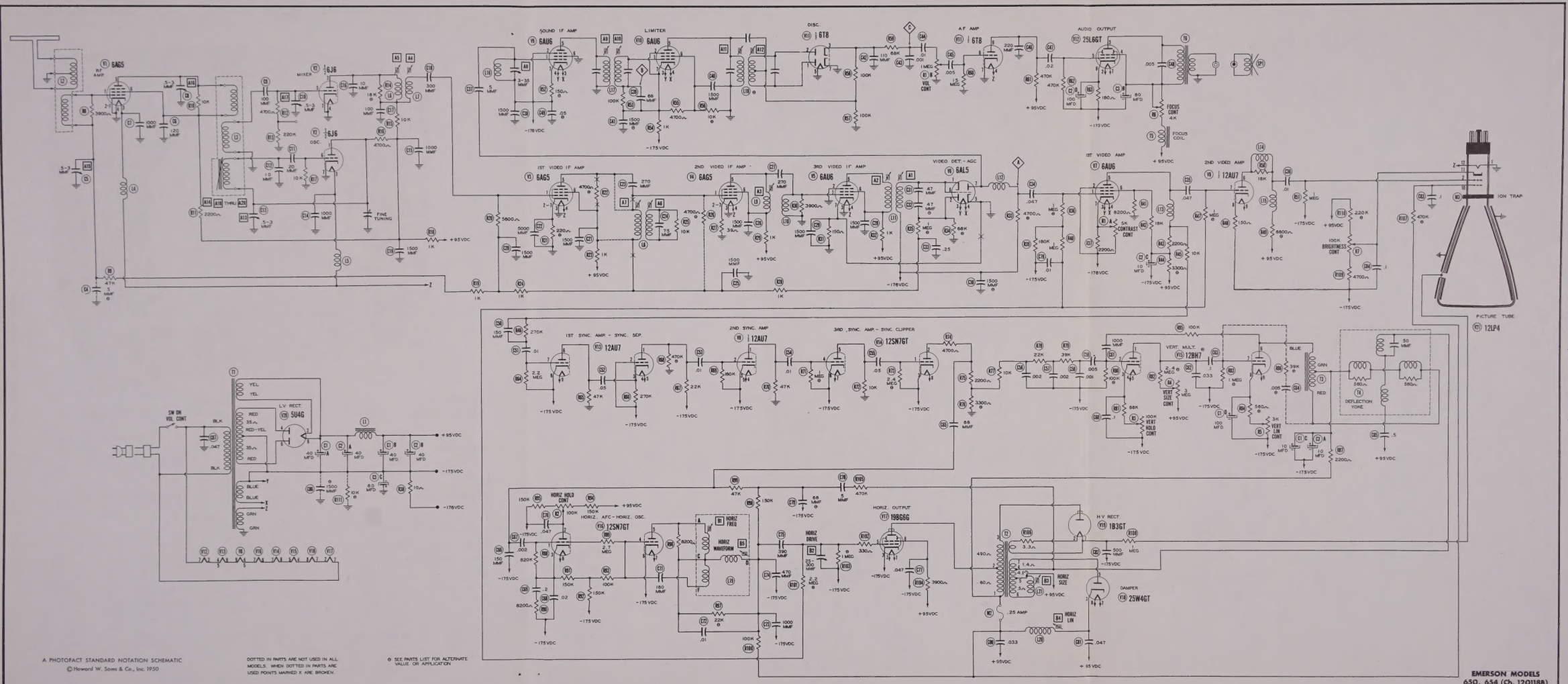

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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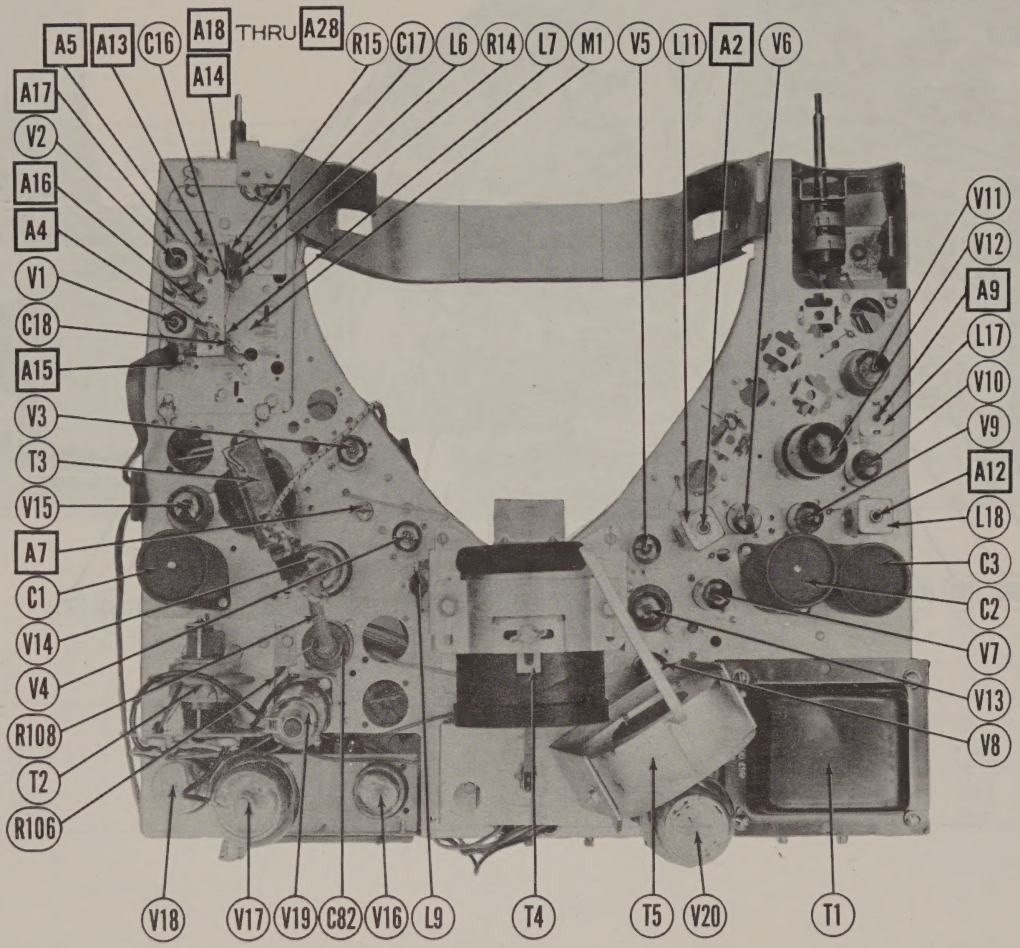
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

EMERSON MODELS
650, 654 (Ch. 120118B)

EMERSON MODELS
650, 654 (Ch. 120118B)



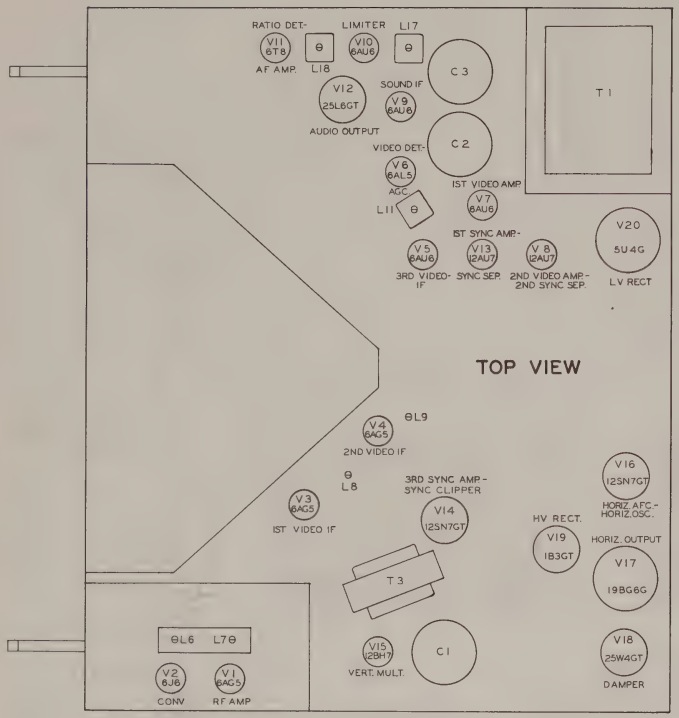
CHASSIS TOP VIEW

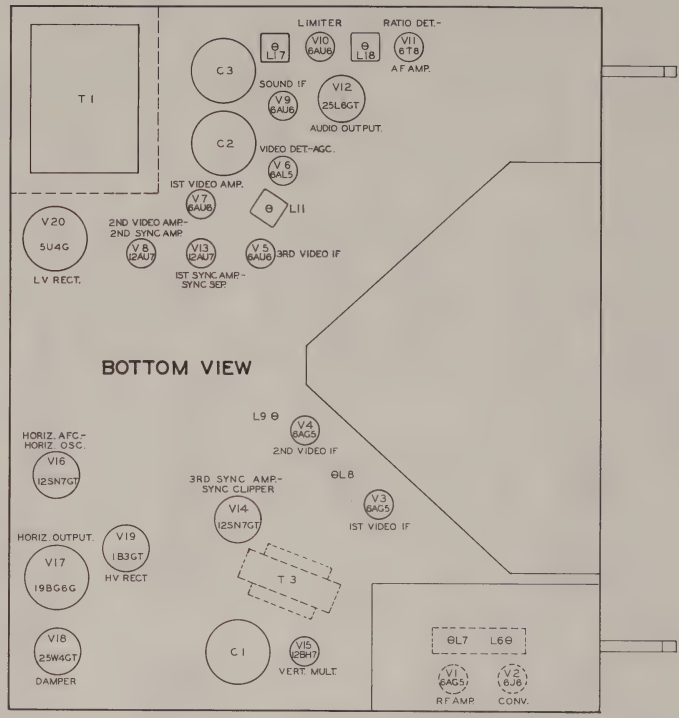
650, 654 (Ch. 120118B)

EMERSON MODELS

CHASSIS BOTTOM VIEW–CAPACITOR AND ALIGNMENT IDENTIFICATION

EMERSON MODELS
650, 654 (Ch. 120118B)





TUBE PLACEMENT CHART

650, 654 (Ch. 120118B)

EMERSON MODELS

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If receiver is to be aligned with picture tube removed, the high voltage lead should be securely taped and dressed away from the chassis.

VIDEO IF ALIGNMENT

Replace the converter tube (V2) from its socket and replace with a 6J6 , which has had pin 1 removed, to prevent erroneous indications.
Before attempting step 5, connect the negative terminal of a 3 volt battery to the junction of R35 and R28 and the positive terminal to chassis.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (Grid) of 6AU6 (V5). Low side to chassis.	23.5MC (10MC SWP)	25.75MC	Any	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A1, A2	Adjust for response curve similar to figure 1 with marker as shown.
2.	.001MFD	High side to pin 1 (Grid) of 6AU6 (V4). Low side to chassis.	"	25.25MC	"	"	A3	Adjust for response curve similar to figure 2 with markers as shown.
3.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	"	25.75MC	"	Vert. Amp. thru detector probe as shown in figure 3 to pin 1 (Grid) of 6AU6 (V4). Low side to chassis.	A4, A5	Adjust for response curve similar to figure 4 with markers as shown.
4.	Direct	"	"	22.8MC 21.25MC	"	Vert. Amp. thru detector probe to pin 1 (Grid) of 6AU6 (V5). Low side to chassis.	A6, A7	Adjust A6 to place 21.25MC marker as shown in figure 5. Adjust A7 to place 22.8MC marker.
5.	Direct	"	"	21.25MC 22.25MC 25.75MC	"	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.		Check for response curve similar to figure 6. The 22.25MC and 25.75MC marker should be at 50% response. If necessary, SLIGHTLY retouch A3 thru A7 for proper response.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.001MFD	High side to Point A . Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. thru 100KΩ to Point (B). Low side to chassis.	A8, A9, A10	Adjust for maximum amplitude and symmetry as per figure 7.
7.	.001MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A11, A12	Adjust A12 to place 4.5MC at center of diagonal line as per figure 8. Adjust A-11 for maximum amplitude and straightness of diagonal line.

RF TUNER ALIGNMENT

Remove the dummy converter tube (V2) and replace original 6J6 in its socket.
The overall channel oscillator circuit adjustment A13 is pre-set at the factory and should not require adjustment in the field.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	300Ω carbon res.	High side thru 300Ω too one antenna terminal. Low side to other antenna terminal.	207MC (10MC SWP)	209.75MC	12	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A14	Adjust to place sound marker as shown in figure 6 in sound trap "notch".
9.	"	"	"	"	"	"	A15, A16, A17	Adjust for maximum amplitude and band with of response curve.
10.	"	"	213MC (10MC SWP)	215.75MC	13	"	A18	Adjust as in step 8.
			201MC (10MC SWP)	203.75MC	11		A19	
			195MC (10MC SWP)	197.75MC	10		A20	
			189MC (10MC SWP)	191.75MC	9		A21	
			183MC (10MC SWP)	185.75MC	8		A22	
			177MC (10MC SWP)	179.75MC	7		A23	
			85MC (10MC SWP)	87.75MC	6		A24	
			79MC (10MC SWP)	81.75MC	5		A25	
			69MC (10MC SWP)	71.75MC	4		A26	
			63MC (10MC SWP)	65.75MC	3		A27	
			57MC (10MC SWP)	59.75MC	2		A28	

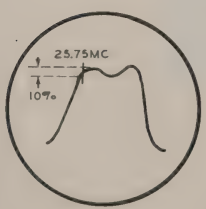


FIG.1

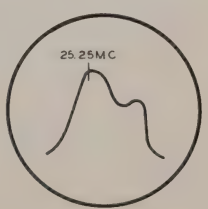


FIG.2

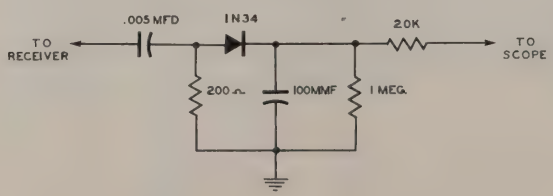


FIG.3

ALIGNMENT INSTRUCTIONS (CONT.)

FIG. 4

FIG. 5

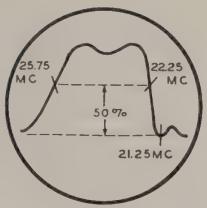


FIG. 6

FIG. 7

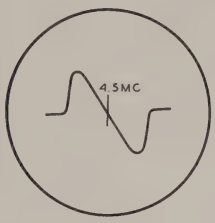


FIG. 8

DISASSEMBLY INSTRUCTIONS

1. Remove four push-on type control knobs.
2. Remove six wood screws holding rear cover in place. Remove cover.
3. Disconnect built-in antenna.
4. Disconnect speaker leads.
5. Remove four 5/8" hex head bolts from bottom of cabinet.
6. Remove chassis.
7. Remove two phillips head screws holding speaker in cabinet.
8. Remove speaker.

FOR REMOVAL OF PICTURE TUBE FOLLOW INSTRUCTIONS ABOVE.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	#-.5VDC	#0V.	#6.3VAC	#0V.	#70VDC	#70VDC	#0V.		
V 2	6J8	#55VDC	#60VDC	#6.3VAC	#0V.	#-.8VDC	#§-2.2VDC	#0V.		
V 3	6AG5	#-.4VDC	#.8VDC	#0V.	#6.3VAC	#85VDC	#90VDC	#.8VDC		
V 4	6AG5	#-.4VDC	#.3VDC	#0V.	#6.3VAC	#90VDC	#90VDC	#.3VDC		
V 5	6AU6	#0V.	¶0V.	#0V.	#6.3VAC	#95VDC	#95VDC	#1VDC		
V 6	6AL5	.2VDC	#-.1VDC	0V.	6.3VAC	#1VDC	.2VDC	-.3VDC		
V 7	6AU6	-.2VDC	.2VDC	0V.	6.3VAC	265VDC	210VDC	3.6VDC		
V 8	12AU7	38VDC	-.5VDC	0V.	¶37VAC	¶37VAC	225VDC	-.7VDC	1.2VDC	¶30VAC
V 9	6AU6	.1VDC	.2VDC	6.3VAC	0V.	185VDC	185VDC	2.4VDC		
V 10	6AU6	5.4VDC	9.3VDC	0V.	6.3VAC	185VDC	38VDC	9.3VDC		
V 11	6T8	#-.9VDC	#-.9VDC	#-.2VDC	#6.3VAC	#0V.	#0V.	#0V.	#-.9VDC	#45VDC
V 12	25L6GT	0V.	¶25VAC	85VDC	90VDC	0V.	0V.	¶0V.	6.4VDC	
V 13	12AU7	7.8VDC	0V.	1VDC	¶25VAC	¶25VAC	42VDC	-.5VDC	0V.	¶30VAC
V 14	12SN7GT	-6VDC	170VDC	0V.	-2VDC	115VDC	0V.	¶49VAC	¶62VAC	
V 15	12BH7	40VDC 15VDC	-.5VDC	3VDC 6VDC	¶75VAC	¶62VAC	340VDC	0V.	14VDC 27VDC	¶69VAC
V 16	12SN7GT	-1.6VDC	160VDC 90VDC	-2VDC	-43VDC	195VDC	0V.	¶37VAC	¶49VAC	
V 17	19BG6G	0V.	¶98VAC	0V.	0V.	-15VDC	-15VDC	¶117VAC	250VDC	TOP CAP •
V 18	25W4GT	0V.	0V.	400VDC	0V.	270VDC	0V.	¶98VAC	¶75VAC	
V 19	1B3GT		• DO NOT MEASURE							
V 20	5U 4G	0V.	300VDC	0V.	300VAC	0V.	300VAC	0V.	300VDC	
V 21	12LP4	#0V.	0V.	PIN 10 380VDC	PIN 11 3VDC 90VDC	PIN 12 #6.3VAC				

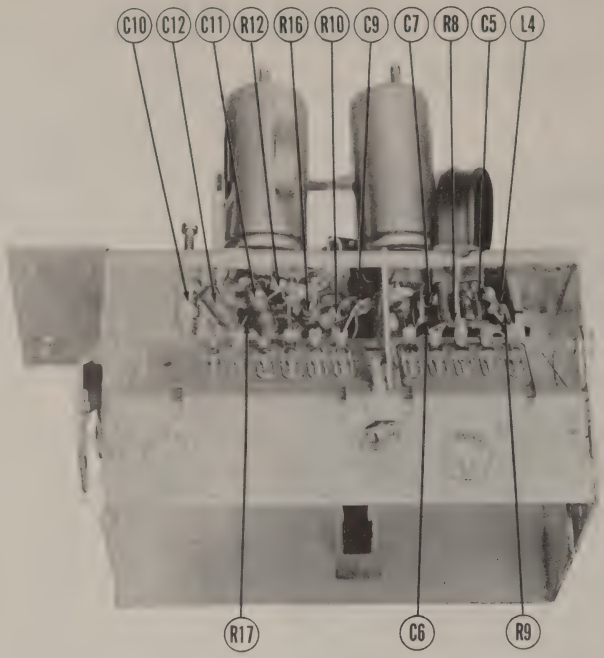
ALL MEASUREMENTS MADE TO -175VDC LINE UNLESS OTHERWISE NOTED.
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
¶ MEASURED FROM JUNCTION OF AC POWER SWITCH AND PIN 7 OF V12.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
# MEASURED FROM CHASSIS GROUND.
• DO NOT MEASURE.

RESISTANCE READINGS

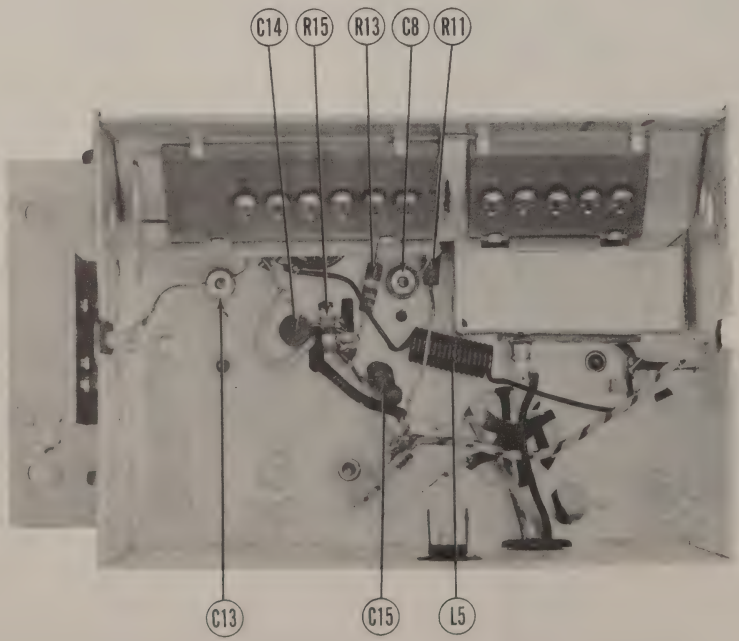
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	#1.1Meg.	#0Ω	#.1Ω	#0Ω	†3.4KΩ	†3.4KΩ	#0Ω		
V 2	6J6	†5.3KΩ	†11KΩ	#.1Ω	#0Ω	#225KΩ	#10KΩ	#0Ω		
V 3	6AG5	#1 Meg.	#220Ω	#0Ω	#.1Ω	†5.8KΩ	†1.1KΩ	#220Ω		
V 4	6AG5	#1 Meg.	#39Ω	#0Ω	#.1Ω	†1.1KΩ	† 1.1KΩ	#39Ω		
V 5	6AU6	#2.7Ω	#0Ω	#0Ω	#.1Ω	†1.1KΩ	†1.1KΩ	#150Ω		
V 6	6AL5	11Ω	#68KΩ	0Ω	.1Ω	#150Ω	11Ω	4.7KΩ		
V 7	6AU6	1.2 Meg.	10Ω	0Ω	.1Ω	†5.7KΩ	†16KΩ	1.8KΩ		
V 8	12AU7	#47KΩ	180KΩ	0Ω	¶13Ω	¶13Ω	†6.9KΩ	2 Meg.	150Ω	¶11Ω
V 9	6AU6	16Ω	10Ω	.1Ω	0Ω	#2.5Ω	#0Ω	160Ω		
V 10	6AU6	100KΩ	1000Ω	0Ω	.1Ω	#1.7Ω	5.7KΩ	1000Ω		
V 11	6T8	#100KΩ	#100KΩ	#200KΩ	#.1Ω	#0Ω	Inf.	#0Ω	#15 Meg.	†470KΩ
V 12	25L6GT	Inf.	¶9Ω	†6.2KΩ	†6KΩ	510KΩ	Inf.	¶0Ω	180Ω	
V 13	12AU7	22KΩ	0Ω	270KΩ	¶9Ω	¶9Ω	#47KΩ	2.2 Meg.	0Ω	¶11Ω
V 14	12SN7GT	2.4 Meg.	#10KΩ	0Ω	1 Meg.	#10KΩ	0Ω	¶14Ω	¶15Ω	
V 15	12BH7	†2.4 Meg. †5.4 Meg.	100KΩ	168KΩ 68KΩ	¶14Ω	¶15Ω	▲3.6KΩ	1 Meg.	3.6KΩ 560Ω	¶15Ω
V 16	12SN7GT	850KΩ	†110KΩ †120KΩ	300KΩ	250KΩ	▲100KΩ	0Ω	¶13Ω	¶14Ω	
V 17	19BG6G	Inf.	¶9Ω	0Ω	Inf.	800KΩ	800KΩ	¶1.8Ω	†4KΩ	TOP CAP ▲90Ω
V 18	25W4GT	Inf.	Inf.	120KΩ	Inf.	†120Ω	Inf.	¶9Ω	¶14Ω	
V 19	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ▲580Ω
V 20	5U4G	Inf.	25KΩ	Inf.	35Ω	Inf.	35Ω	Inf.	25KΩ	
V 21	12LP4	#0Ω	1 Meg.	PIN 10 ▲480KΩ	PIN 11 180KΩ 110KΩ	PIN 12 #.1Ω				

ALL MEASUREMENTS MADE TO -175VDC LINE UNLESS OTHERWISE NOTED.
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
¶ MEASURED FROM JUNCTION OF AC POWER SWITCH AND PIN 7 OF V12.
# MEASURED FROM CHASSIS GROUND.
† MEASURED FROM PIN 8 OF V20.
▲ MEASURED FROM PIN 3 OF V18.

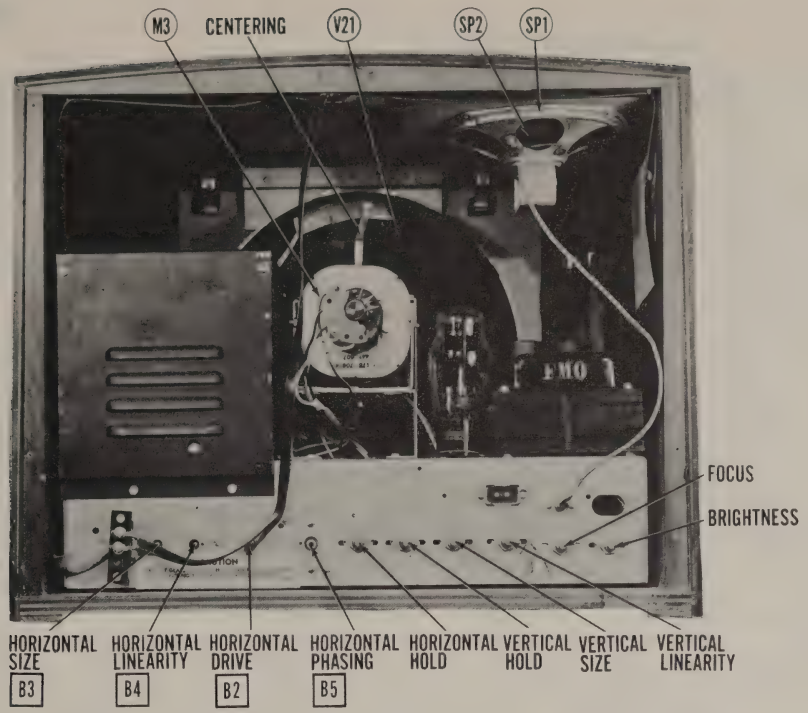
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENT

HORIZONTAL OSCILLATOR ALIGNMENT CHECK

Turn the receiver on and tune in a TV station preferably a test pattern.

Turn the horizontal hold control fully clockwise. The picture should remain in synchronization. Momentarily remove the signal by switching to another channel and back again. The picture normally will be out of sync. Turn the hold control slowly counter-clockwise and note the number of blanking bars just before picture pulls into sync. There should be 3 or 4 bars present just before pull-in, with the control approximately 90° from the fully counter-clockwise position. The picture should remain in synchronization for an additional 90° counter-clockwise rotation of the hold control. If the receiver does not meet these requirements, alignment of the horizontal oscillator circuit will be required.

HORIZONTAL FREQUENCY ADJUSTMENT

Connect a short between terminals C and D of L19.

Tune in a TV station preferably a test pattern.

Turn the horizontal hold control fully counter-clockwise. Adjust the horizontal frequency slug (B1) until picture is just out of sync and the horizontal blanking bar appears as a single vertical bar.

Turn the horizontal hold control 1/4 turn from fully clockwise position and adjust the horizontal drive trimmer (B2) the horizontal size slug (B3) and the horizontal linearity slug (B4) until picture width and linearity is correct. If B2, B3 and B4 was adjusted, repeat the adjustment of B1.

HORIZONTAL WAVEFORM ADJUSTMENT

Remove the short from terminals C and D of L19.

Turn the horizontal hold control fully counter-clockwise. Adjust the horizontal waveform slug (B5) until the horizontal blanking bar appears.

Connect the vertical input of an oscilloscope thru a 22KΩ resistor to terminal C of L19 and chassis. The pattern on the scope should be similar to figure 9. Adjust B5 until the broad and narrow peaks are of equal amplitude. If necessary, while making this adjustment, turn the horizontal hold control to keep picture in sync.

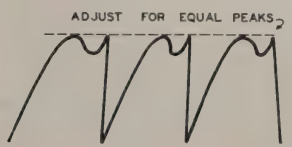


FIG. 9

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No	USE	REPLACEMENT DATA EMERSON PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp	800535	6AG5	7BD	
V2	Converter	800336	6J6	7BF	
V3	1st Video IF	800535	6AG5	7BD	
V4	2nd Video IF	800535	6AG5	7BD	
V5	3rd Video IF	800533	6AU6	7BK	
V6	Video DET-AGC	800541	6AL5	6BT	
V7	1st Video Amp.	800535	6AU6	7BK	
V8	2nd Video Amp. - 3rd Sync. Amp.	800096	12AU7	9A	
V9	Sound IF Amp.	800533	6AU6	7BK	
V10	Limiter	800533	6AU6	7BK	
V11	Discr. - AF Amp.	800035	6T8	9E	
V12	Audio Output	800490	25L6GT	7AC	
V13	1st Sync. Amp. - Sync Sep.	800096	12AU7	9A	
V14	3rd Sync. Amp. - Sync. Clipper	800039	12SN7GT	8BD	
V15A	Vert. Mult.	800039	12SH7	8BD	
B	Vert. Mult.	800039	12SN7GT	8BD	
V16	Hor. AFC-Hor. Osc.	800039	12SN7GT	8BD	
V17	Hor. Output	800044	19DG6G	5BT	
V18	Damper	800045	25W4GT	4CG	
V19	HV Rect.	800450	15GP	5CK	
V20	I.F Rect.	800490	5U4G	5T	
V21	Picture Tube	810003	12L P4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	VOLT	EMERSON- PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	925166	AF882J20C		UPT403		TVL-4747	▲ Filter
B	40	450							■ Filter
C	10	450							▲ Vert. Output Dec.
D	100	100							Vert. Output Cath.
C2A	40	450	925166	AF882J20C		UPT403		TVL-4747	▲ Filter
B	40	450							■ Filter
C	10	450							▲ 1st V. Amp. Dec.
D	100	100							Output Cathode
C3A	40	450	925165	AFH2J165F		UPT8825-165			▲ Vert. Output Dec.
B	80	350							■ Decoupling
C	80	350							▲ Filter
C4	.5			SI5MPO	TCZ-4.7		NP0K-5		Fixed Trimmer †
C5	5-3				829-3				Variable Trimmer
C6	120			SI20	D6-12			GP2K-120	19C29
C7	1000			SI000	D6-102		GP2L-001	19C1	RF Decoupling
C8	5-3				829-3				RF Fil. Bypass
C9	100			SI100	D6-101		GP1K-100	19C11	▲ Filter
C10	20-3				829-3				Variable Trimmer
C11	20			SI3GNPO	TCZ-20		NP0K-20		Osc. Grid Cap.
C12	10			SI0N750	TCN-10		N750K-10	19C4	Fixed Trimmer
C13	5-3				829-3				Variable Trimmer
C14	1000			SI1000	D6-102		GP2L-001	19C1	Conv. Fil. Bypass
C15	1000			SI1000	D6-102		GP2L-001	19C1	RF Bypass
C16	10	500		1469-00001	TCZ-10		NP0K-10	19C3	Fixed Trimmer
C17	100			SI100	D5-101		GP1K-100	19C11	Conv. Plate Dec.
C18	330			SI330	D6-301		GP2K-330	19C14	IF Coupling
C19	1500		928005	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C20	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C21	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Dec.
C22	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Cath.
C23	270	500	910015	1468-00025	D6-271	5W5T25	1FM-325	GP2K-270	IF Coupling
C24	75			SI75NPO	TCZ-75		NP0M-75		Fixed Trimmer
C25	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C26	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd V. IF Dec.
C27	270	500	910015	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C28	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	3rd V. IF Dec.
C29	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	3rd V. IF Cath.
C30	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass *
C31	47	500	910033	1468-00005	D6-470	5W5Q5	GP1K-47	19C25	IF Coupling
C32	47	500	910033	1468-00005	D6-470	5W5Q5	GP1K-47	19C25	IF Coupling †
C33	25	500	923080	1469-00001		GT2P25		2TM-P25	AGC Filter
C34	.047	400	922025	P468-047	DF-503	PTE4S5		4TM-S47	Video Coupling
C35	.047	400	922025	P468-047	DF-503	PTE4S5		4TM-S47	Video Coupling
C36	.01	600	922015	P468-01	D6-103	PTE8S1	811-01	6TM-S1	Video Coupling
C37	5	500	910130	1469-00005	TCZ-4.7	5R5V5	NP0K-5	M5-55	S. IF Coupling
C38	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C39	68	500	910031	SI68	D6-680	5W5Q7	GP1K-68	M5-47	Limiter Grid Filter
C40	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	Limiter Screen Byp.
C41	1500		928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	Limiter Decoupling †
C42	110	500	910010	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	RF Bypass
C43	.001	600	922079	P888-001	D6-102	PTE2D1	GP2L-001	6TM-D1	De-emphasis
C44	.01	400	923081	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C45	.005	600	923077	P888-005	D6-502	PTE9D5	811-005	6TM-D5	Audio Coupling
C46	220	500	910028	1468-00025	D6-221	5W5T25	GP2K-220	1FM-325	AF Amp. Plate
C47	.02	400	923114	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C48	.005	600	923077	P888-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate
C49	.05	400	923082	P488-05	DF-503	PTE4S5		4TM-S5	RF Bypass †
C50	150	500	910029	1468-00015	D6-151	5W5T15	GP2K-150	1FM-315	Sync. Coupling
C51	.01	400	922015	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Sync. Coupling
C52	.05	400	923082	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C53	.01	400	922015	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Sync. Coupling
C54	.01	400	922015	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Sync. Coupling
C55	.05	400	923082	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C56	.002	600	923088	P888-002	D6-202	PTE6D2	G2PM-002	6TM-D2	Integrator Net.
C57	.002	600	923088	P888-002	D6-202	PTE6D2	G2PM-002	6TM-D2	Integrator Net.
C58	.001	600	923079	P888-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Integrator Net.
C59	.005	600	923077	P888-005	D6-502	PTE9D5	811-005	6TM-D5	Vert. Sync. Coupling
C60	.1	200	922014	P288-1	DF-104	PTE4P1		2TM-P1	Vert. MV Cath.
C61	1000	500	910027	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Vert. MV Feedback
C62	.033	600	922034	P888-033		PTE6S3		6TM-S3	Vert. Discharge
C63	.1	400	922008	P488-1	DF-104	PTE4P1		4TM-P1	Vert. Sweep Coupling

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	VOLT	EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C64	.005	600	923077	P888-005	D6-502	PTE6D5	811-005	6TM-D5	Vert. Feedback
C65	68	500	910031	SI68	D6-680	5W5Q7	GP1K-68	M2-47	Hor. Sync. Coupling
C66	150	500	910029	1468-00015	D6-151	5W5T15	GP2K-150	1FM-315	Voltage Divider
C67	.002	600	923083	P888-002	D6-202	PTE6D2	G2PM-002	6TM-D2	Hor. Sync. Coupling
C68	.02	400	923114	P488-02	DF-203	PTE4S2		4TM-S2	AFC Filter
C69	.1	200	923096	P288-1		PTE4P1		2TM-P22	AFC Filter
C70	.047	400	923025	P488-047	DF-503	PTE4S5		4TM-S47	Hor. AFC Plate
C71	180	500	910042	1469-0002	D6-181	5R5T2	GP2K-180	M5-37	Hor. Osc. Grid
C72	.01	600	923040	P888-01		PTE8S1		6TM-S1	Fixed Trimmer
C73	1000	500		1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Discharge
C74	470	500		1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	Hor. Discharge
C75	390	500	910213	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. Sweep Coupling
C76	.01	400	923081	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Bias Filter
C77	.047	600	923073	P888-047	DF-503	PTE6S5		6TM-S47	Hor. Output Screen
C78	5	1000	910045	1469-HV-000005					Hor. Feedback
C79	68	500		SI68	D6-680	5W5Q7	GP1K-68	M5-47	Voltage Divider †
C80	.033	600	922024	P688-033		PTE6S3		6TM-S3	Damper Filter
C81	.047	600	923073	P688-047		PTE6S5		6TM-S47	Damper Filter
C82	500	20000	923053	HV500	TV1-502				HV Filter
C83	.1	400	923064	P488-1	DF-104	PTE4P1		4TM-P1	Acc. Anode Byp.
C84	.1	200	923967	P288-1	DF-104	PTE4P1		2TM-P1	Pic. Tube Cath.
C85	.5	200	923102	P288-5		GT2P3		2TM-P5	Hor. Sweep Coupling
C86	1500	400	928006	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass †
C87	.047	400	923025	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter

* Some models use 5000MFD in this application. Mfgr's Part No. 928109.
† Not used in all models.
† Some models use .05MFD in this application. Mfgr's Part No. 923062.

CONTROLS

ITEM No.	RESIST ANCE	WATTS	REPLACEMENT DATA EMERSON PART No.	IRC PART No.-	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	5000Ω	½	390144	Concentrikit B1T-1/4 * B13-137 * E-187 * T6-1 *	RTV-198	SBB-555-S	Contrast control-front Volume control-rear Attach per instructions in "Concentrikit". Attach per instructions in "Concentrikit".
B	1 Meg.	½					
C	Shaft End						
D	Switch						
R2A	100KΩ	½	390132	Q11-128	AG-49-S	AN-40	Horiz. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R2A per instructions
R3A	100KΩ	½	390132	Q11-128	AG-49-S	AN-40	Vert. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R3A per instructions
R4A	3 Meg.	½	390138	Q11-140	AG-85-S	AN-84	Vert. size control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5	3000Ω	2	390135	WK-3000	43-3000	VK-133	Vert. linearity control-Wire Wound
R6	4000Ω	4	390139		RTV-106	SVS-929	Focus control-Wire Wound
R7A	100KΩ	½	390132	Q11-128	AG-49-S	AN-40	Brightness control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R7A per instructions

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	39Ω	½	340032	BTS-3900	Antenna Coil Shunt
R9	47KΩ 20%	½	340892	BTS-47K	AGC Network
R10	10KΩ	½	340732	BTS-10K	RF Amp. Plate Coil Shunt
R11	2200Ω	½	340572	BTS-2200	RF Amp. Decoupling
R12	4700Ω	½	340652	BTS-4700	Mixer Grid
R13	220KΩ	½		BTS-220K	Mixer Grid
R14	18KΩ	½	370792		1st Video IF Transformer Shunt
R15	10KΩ	½	340732	BTS-10K	Conv. Decoupling
R16	4700Ω	½	340652	BTS-4700	Osc. Plate
R17	10KΩ	½	340732	BTS-10K	Osc. Grid
R18	1000Ω	½	340492	BTS-1000	Decoupling
R19	1000Ω	½	340492	BTS-1000	AGC Network
R20	5600Ω	½	340672	BTS-5600	1st Video IF Amp. Grid
R21	220Ω	½		BTS-220	1st Video IF Amp. Cathode-See Note 1
R22	4700Ω	½	370652	BTA-4700	1st Video IF Amp. Plate-See Note 2
R23	1000Ω	½	340492	BTS-1000	1st Video IF Amp. Decoupling
R24	1000Ω	½	340492	BTS-1000	AGC Network
R25	10KΩ	½	340732	BTS-10K	Trap Coil Shunt
R26	4700Ω	½	340652	BTS-4700	2nd Video IF Amp. Grid-See Note 2
R27	39Ω	½	370152		2nd Video IF Amp. Cathode
R28	1000Ω	½	340492	BTS-1000	AGC Network
R29	1000Ω	½	340492	BTS-1000	3rd Video IF Amp. Decoupling
R30	3900Ω	½	340632	BTS-3900	3rd Video IF Choke Shunt
R31	150Ω	½	340292	BTS-150	3rd Video IF Amp. Cathode
R32	1000Ω	½	340492	BTS-1000	3rd Video IF Amp. Decoupling
R33	4700Ω	½	370652	BTA-4700	Video Det. Diode Load-See Note 3
R34	68KΩ	½	340932	BTS-68K	AGC Diode Load-See Note 4
R35	1 Meg.	½	341212	BTS-1 Meg.	AGC Network-See Note 5
R36	1 Meg.	½	341212	BTS-1 Meg.	1st Video Amp. Grid-See Note 5
R37	2200Ω	½	341572	BTS-2200	Contrast Control Shunt
R38	10Ω	½	341012	BW-|-10	Bias Network
R39	180KΩ	½	340332	BTS-180K	Voltage Divider
R40	1 Meg. 5%	½	341212	BTS-1 Meg. 5%	Bias Network
R41	8200Ω	½	340712	BTS-8200	Voltage Divider
R42	18KΩ	½	370782	BTA-18K	1st Video Amp. Screen
R43	2200Ω	½	340572	BTS-2200	1st Video Amp. Plate
R44	3300Ω	½	340612	BTS-3300	1st Video Amp. Decoupling-See Note 6
R45	10KΩ	½	340732	BTS-10K	Isolation
R46	270KΩ	½	341072	BTS-270K	Isolation
R47	1 Meg.	½	341212	BTS-1 Meg.	2nd Video Amp. Grid-See Note 5
R48	150Ω	½	340292	BTS-150	2nd Video Amp. Cathode
R49	6800Ω	½	370692	BTA-6800	2nd Video Amp. Plate-See Note 7
R50	18KΩ	½	340792	BTS-18K	Peaking Coil Shunt
R51	1 Meg. 5%	½	341212	BTS-1 Meg. 5%	Picture Tube Grid
R52	150Ω	½	340292	BTS-150	Sound IF Amp. Cathode-See Note 8
R53	100KΩ 5%	½	330972	*	Limiter Grid
R54	1000Ω	½	340492	BTS-1000	Limiter Cathode
R55	4700Ω	½	340652	BTS-4700	Voltage Divider
R56	10KΩ	½	340732	BTS-10K	* Limiter Screen-See Note 9
R57	100KΩ	½	340972	BTS-100K	Disc. Diode Load

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES
R58	100KΩ 5%	½	330972	BTS-100K-5%	Disc. Diode Load
R59	68KΩ	½	340932	BTS-68K	De-emphasis
R60	15 Meg. 5%	½	351492	BTS-15 Meg. 5%	AF Amp. Grid
R61	470KΩ	½	341132	BTS-470K	AF Amp. Plate
R62	470KΩ	½	341132	BTS-470K	Audio Output Grid
R63	180Ω	2	370312	BW-2-180	Audio Output Cathode-Wire Wound
R64	2.2 Meg.	½	341292	BTS-2.2 Meg.	1st Sync. Amp. Grid
R65	47KΩ	½	370892	BTA-47K	1st Sync. Amp. Grid
R66	270KΩ	½	341072	BTS-270K	Sync. Sep. Cathode
R67	22KΩ	½	340812	BTS-22K	Sync. Sep. Plate
R68	470KΩ	½	341132	BTS-470K	Voltage Divider-See Note 10
R69	180KΩ	½	340332	BTS-180K	2nd Sync. Amp. Grid
R70	47KΩ	½	370892	BTA-47K	2nd Sync. Amp. Plate
R71	1 Meg.	½	341212	BTS-1 Meg.	3rd Sync. Amp. Grid-See Note 5
R72	10KΩ	½	340732	BTS-10K	3rd Sync. Amp. Plate
R73	2.4 Meg.	½	341292	BTS-2.2 Meg.	Sync. Clipper Grid-See Note 11
R74	4700Ω	½	370652	BTA-4700	Sync. Clipper Plate
R75	2200Ω	½	340572	BTS-2200	Sync. Clipper Cathode
R76	3300Ω	½	340612	BTS-3300	Voltage Divider-See Note 6
R77	10KΩ	½	340732	BTS-10K	Integrator
R78	22KΩ	½	340812	BTS-22K	Integrator
R79	39KΩ	½	340872	BTS-39K	Integrator
R80	100KΩ	½	340972	BTS-100K	Vert. Mult. Grid-See Note 12
R81	68KΩ	½	340932	BTS-68K	Vert. Mult. Cathode
R82	2.4 Meg. 5%	½	341292		Vert. Mult. Plate-See Note 13
R83	1 Meg.	½	341372	BTS-4.7 Meg.	Vert. Amp. Grid-See Notes 5 and 18
R84	560Ω	½	340432	BTS-560	Vert. Amp. Cathode-See Note 2
R85	100KΩ	½	340972	BTS-100K	Feedback
R86	39KΩ	½	340872	BTS-39K	Vert. Peaking-See Note 2
R87	2200Ω	½	370572	BTA-2200	Vert. Amp. Decoupling
R88	820KΩ 5%	½	331192	BTS-820K-5%	Horiz. AFC Grid
R89	2.7 Meg. 5%	½	331312	BTS-2.7 Meg. 5%	Voltage Divider
R90	8200Ω	½	340712	BTS-8200	Horiz. AFC Filter Network
R91	150KΩ 5%	½	331012	BTS-150K-5%	Horiz. AFC Cathode
R92	150KΩ 5%	½	331012	BTS-150K-5%	Horiz. AFC Cathode
R93	100KΩ 5%	½	330972	BTS-100K-5%	Horiz. Osc. Grid
R94	150KΩ	½	341032	BTS-150K	Voltage Divider
R95	150KΩ	½	340812	BTS-150K	Voltage Divider
R96	8200Ω	½	340712	BTS-8200	Horiz. Osc. Transformer Shunt
R97	22KΩ	½	340812	BTS-22K	Horiz. Osc. Transformer Shunt-See Note 9
R98	150KΩ 5%	½	331012	BTS-150K-5%	Horiz. AFC Filter Network
R99	47KΩ	½	370892	BTA-47K	Feedback
R100	39KΩ	½	370872	BTA-39K	Horiz. Osc. Plate
R101	2.2 Meg.	½	341292	BTS-2.2 Meg.	Bias Network-See Note 14
R102	330Ω	½	340372		Parasitic Suppressor
R103	1 Meg.	½	341212	BTS-1 Meg.	Horiz. Output Grid-See Note 5
R104	3900Ω	2	397080-1	BTS-3900	Horiz. Output Screen
R105	10KΩ	½	341132	BTS-470K	Feedback
R106	3.3Ω	½	394066		HV Rect. Filament-Wire Wound
R107	470KΩ	½	341132	BTS-470K	Acc. Anode Decoupling-See Note 10
R108	1 Meg.	½	371212		HV Filter
R109	4700Ω	½	340652	BTS-4700	Voltage Divider
R110	220KΩ	½		BTS-220K	Voltage Divider-See Note 15
R111	10KΩ	½	340732	BTS-10K	Isolation-See Note 2

Note 1. Some models use a 68Ω resistor in this application.
Note 2. Not used in all models.
Note 3. Some models use a 6800Ω, 1 watt resistor in this application.
Note 4. Some models use a 33KΩ resistor in this application.
Note 5. Some models use two 2 Meg. resistors in parallel to obtain required resistance and wattage.
Note 6. Some models use two 6800Ω resistors in parallel to obtain required resistance and wattage.
Note 7. Some models use a 4700Ω, 1 watt resistor in this application.
Note 8. Some models use a 120Ω resistor in this application.
Note 9. Some models use two 47KΩ resistors in parallel to obtain required resistance and wattage.
Note 10. Some models use a 240KΩ resistor in series to obtain required resistance and wattage.
Note 11. Some models use a 2.2 Meg. resistor in this application.
Note 12. Some models use a 47KΩ resistor in this application.
Note 13. Some models use a 3.3 Meg. resistor in this application.
Note 14. Some models use two 1 Meg resistor in series to obtain required resistance and wattage.
Note 15. Some models use a 68KΩ resistor in this application.
Note 16. Some models use a 4.7 Meg. resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.5A	640VAC .200ADC	5VAC @ 3A	6.3VAC @ 2.8A SEC. 4 6.3VAC @ 1.3A	730022			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI	SEC	EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	550Ω @ Tap @ 60Ω	60 Tap @ 5Ω, 4, 6Ω SEC. 2 0Ω	738034				Hor. Output Trans.
T3	1000Ω Tap @ 12Ω		738029	A-8123	A-3037	TSO-5	Vert. Output Trans.
T4A	14Ω		708130	DY-1	MD-3		Hor. Deflection Coil
B	63Ω						Vert. Deflection Coil
C			708130R				Alternate Part
T5	2150Ω		708143				Focus Coil

EMERSON MODELS 650, 654 (Ch. 120118B)

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T6	2200Ω	4.4Ω	170Ω	.4Ω	734058	A-3876	A-2928	RO-2	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	EMERSON PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	4.4Ω	180041 ②	ST-108 MOD. P6-X ST-101 ⑤	6A15	② Used in model 650
B	PM	4.1Ω	180050 ③		12A4A	③ Used in model 654
	CONE DIA.	V. C. DIA.				⑤ Replace output transformer to match 6 -8 ohm voice coil.
SP2A	5 7/8"	9/16"				
B	11 7/8"	1"				

FILTER CHOKE

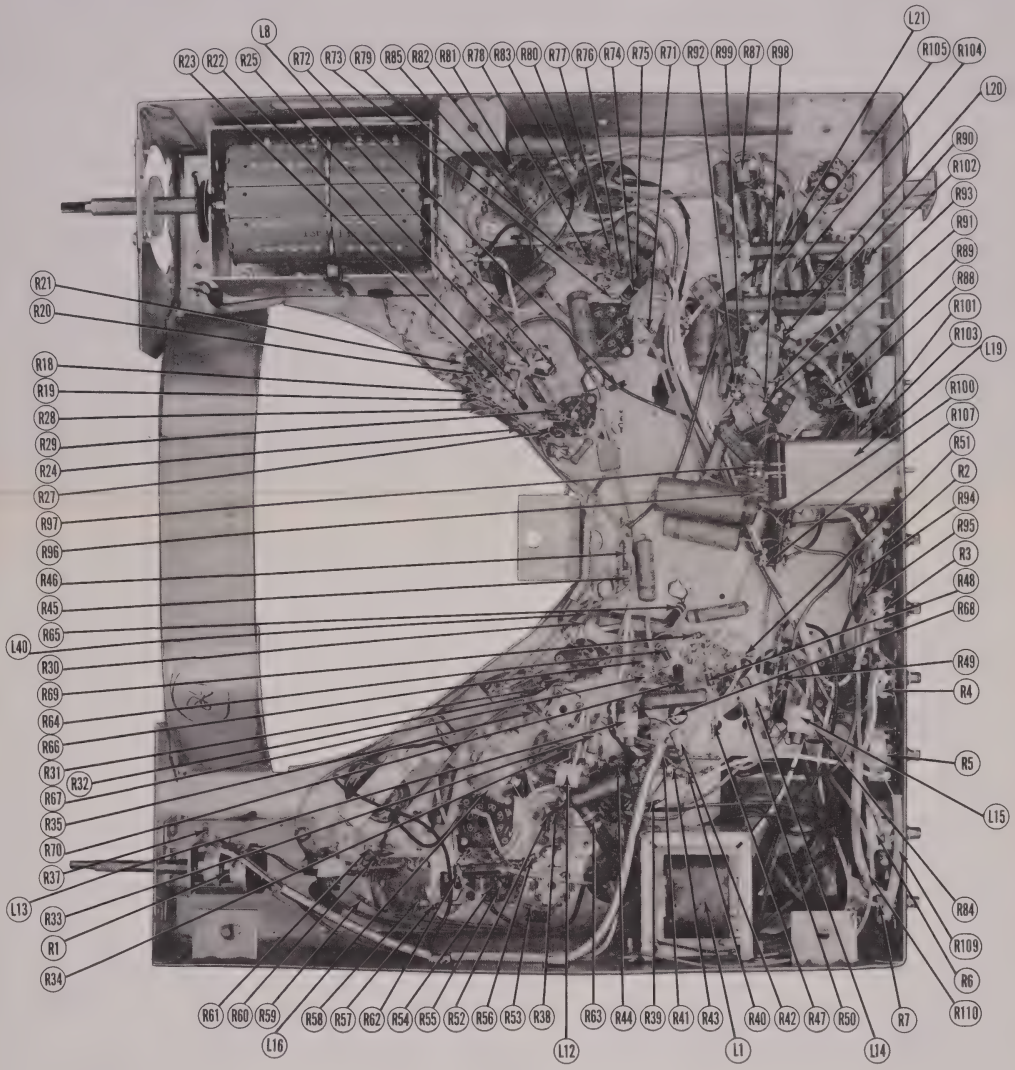
ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∽)	EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.200ADC	100Ω	3.7 Henries	737011	C-1410 ①	C-2991 ①	TR-3300 ①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	
L2	Ant. Coil	0Ω	0Ω	*		* Part of tuner, #470607.
L3	RF, Mixer Grid & Osc. Coils	0Ω		*		
L4	Fil. Choke	0Ω		*		
L5	Fil. Choke	0Ω		*		
L6	1st Video IF Primary	.3Ω		*		
L7	1st Video IF Secondary	.3Ω		*		
L8	2nd Video IF	.3Ω	0Ω	720042		With trap
L9	3rd Video IF	.1Ω		720109		
L10	Grid Choke	2.7Ω		705014		20 microhenries
L11	4th Video IF	1.2Ω	1.2Ω	720089-1		
L12	Peaking	5.5Ω		708096	19-1920	75 microhenries
L13	Peaking	5.5Ω		708096	19-1920	75 microhenries
L14	Peaking	9.2Ω		708095	19-1921	180 microhenries
L15	Peaking	9.8Ω		708114	19-1923	440 microhenries
L16	1st Sound IF	5.8Ω		708097		
L17	2nd Sound IF	2.5Ω	2.5Ω	720081		
L18	Disc. Trans.	1.7Ω	1.7Ω	708018		Alternate part #708017
L19	Horiz. Osc. Trans.	78Ω	50Ω	738035		
L20	Horiz. Lin.	27Ω		708037		
L21	Horiz. Size	.3Ω		708082-1		

MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M1A	RF Tuner	470607	
B	RF Tuner	470606	
M2A	Fuse	808170	.25A 250V Type 3AG
B	Fuse	808050	.25A 250V Type 3AG
M3	Ion Trap	708086	
B2	Trimmer	900054	Horiz. drive, 25-300MMF
A8	Trimmer	900064	1st Sound IF 3-35MMF
	Safety Glass	520124	
	Escutcheon	520103	Channel selector
	Escutcheon	450028	Off-Volume-Contrast
	Knob	450073	Channel selector
	Knob	450074	Fine tuning
	Knob	450071	Contrast
	Knob	450072	Volume
	Cabinet	140333	Model 650
	Cabinet	140349	Model 654



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

HALLICRAFTERS MODELS
680, 681, 690, 715

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MODEL 715

HALLICRAFTERS MODELS
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HALLICRAFTERS
MODELS 680, 681, 690, 715

HALLICRAFTERS MODEL 715

TRADE NAME	Hallicrafters, Models 680, 681, 690, 715
MANUFACTURER	The Hallicrafters Co., 5th and Kostner Ave., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.5 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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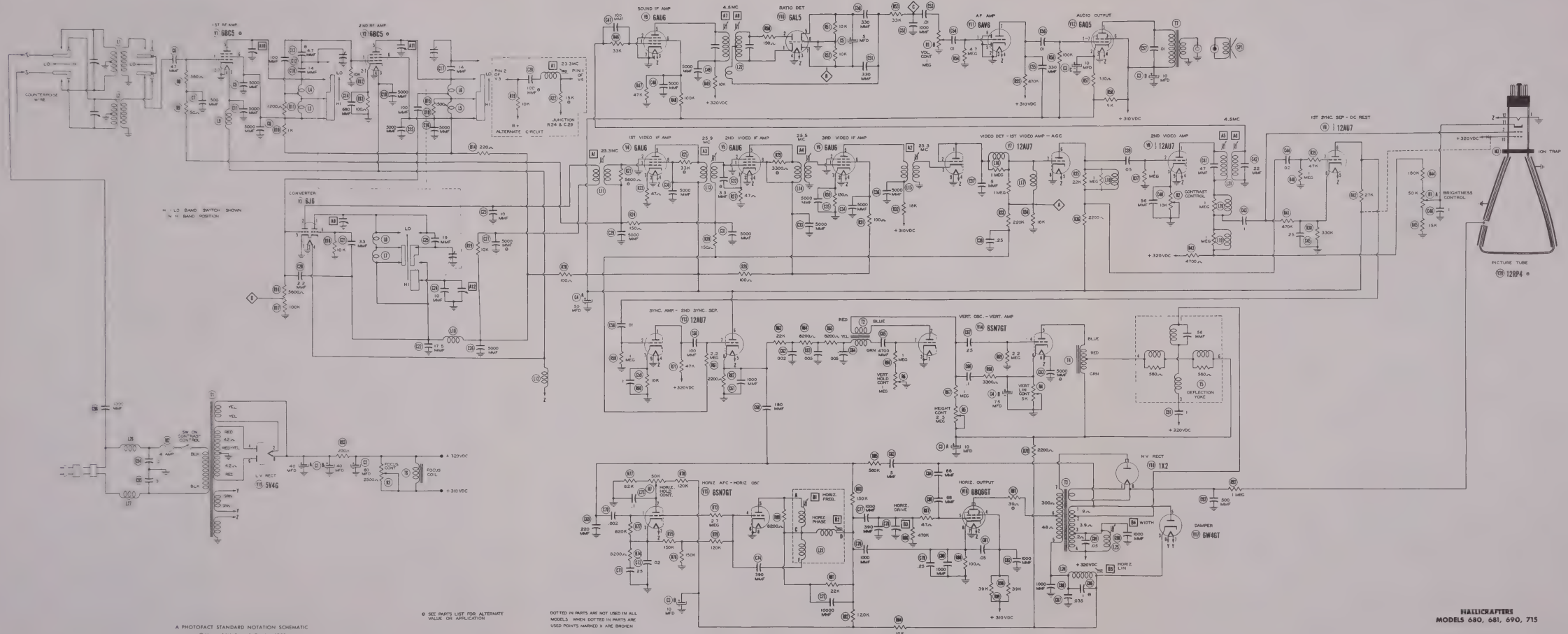

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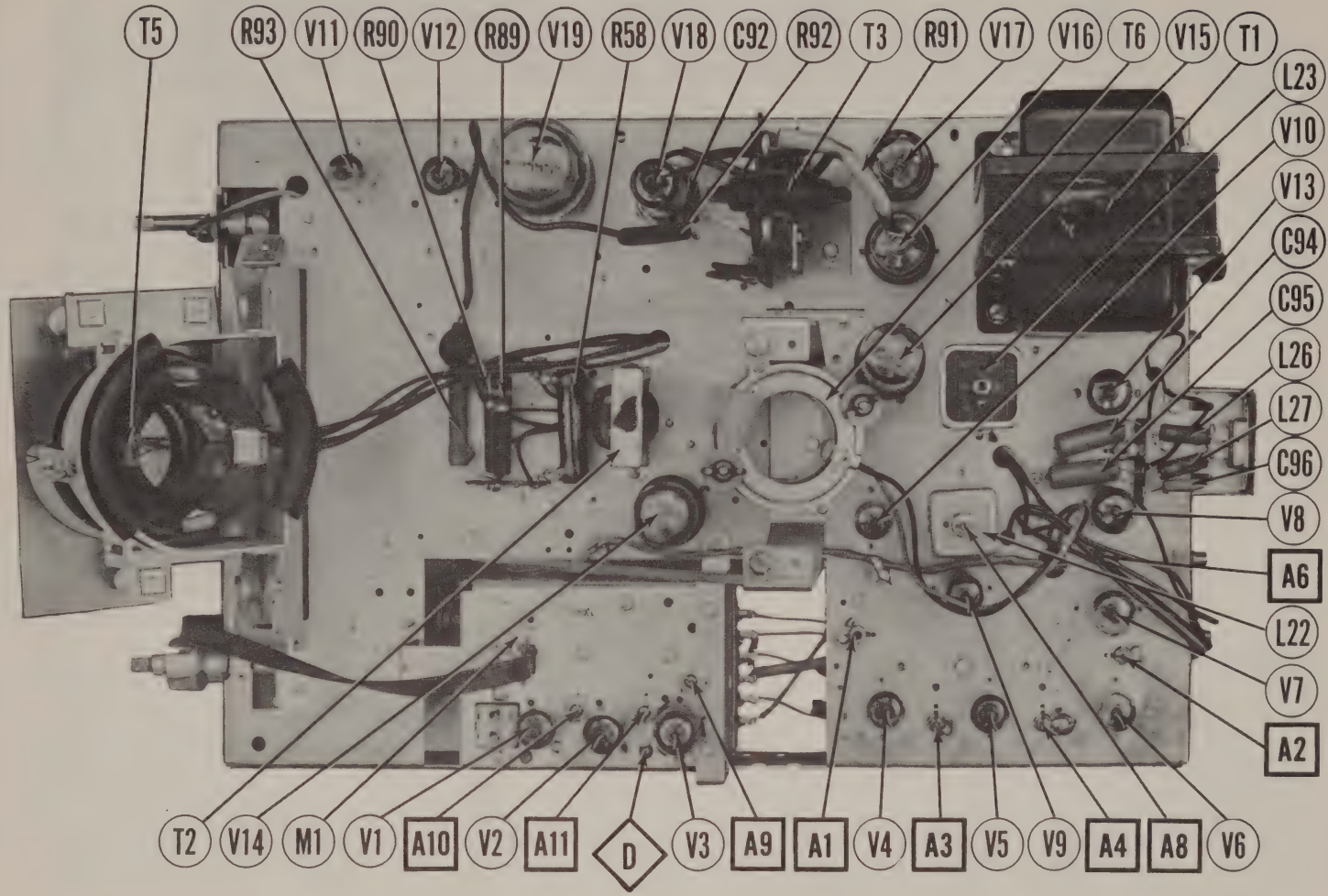
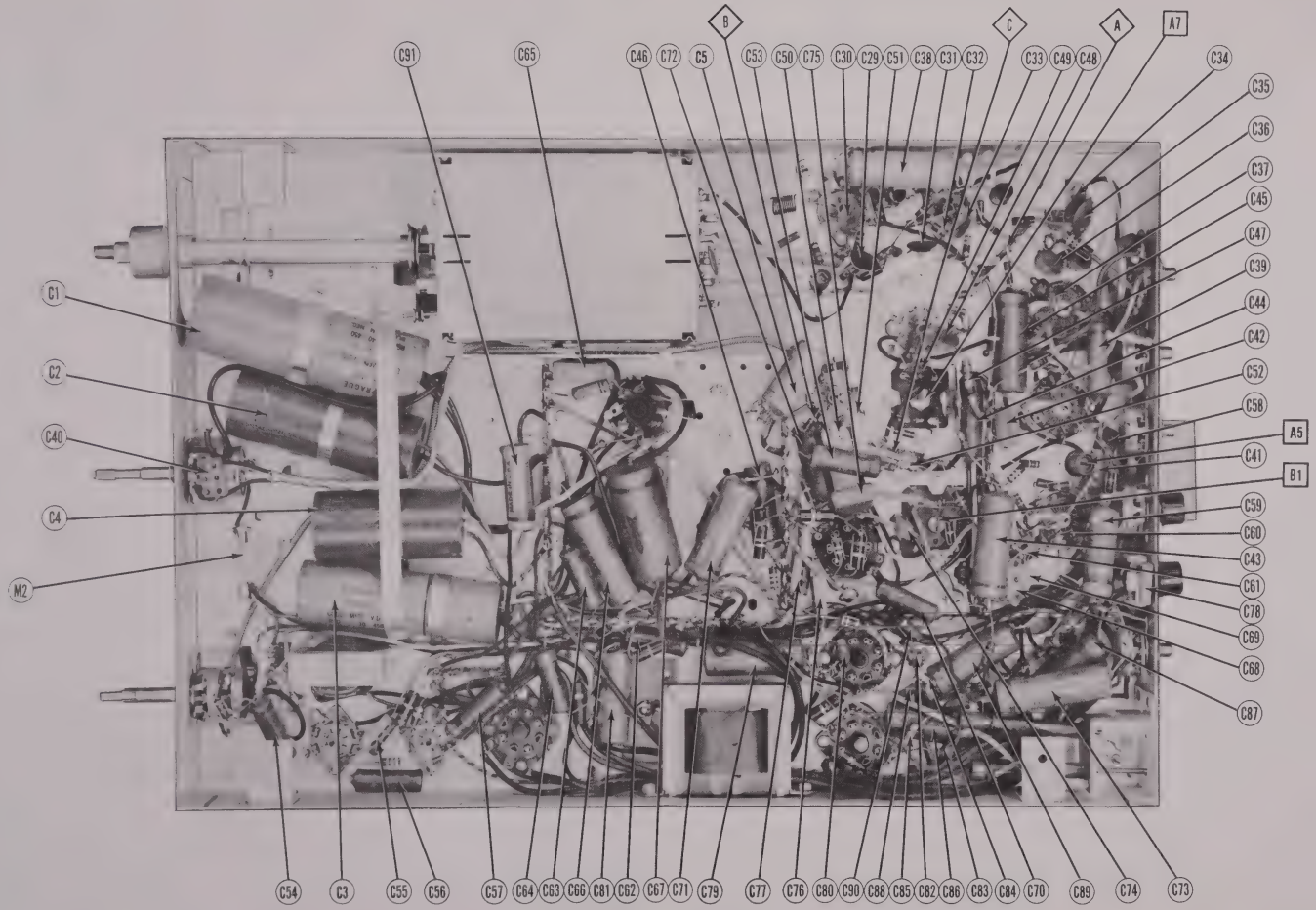
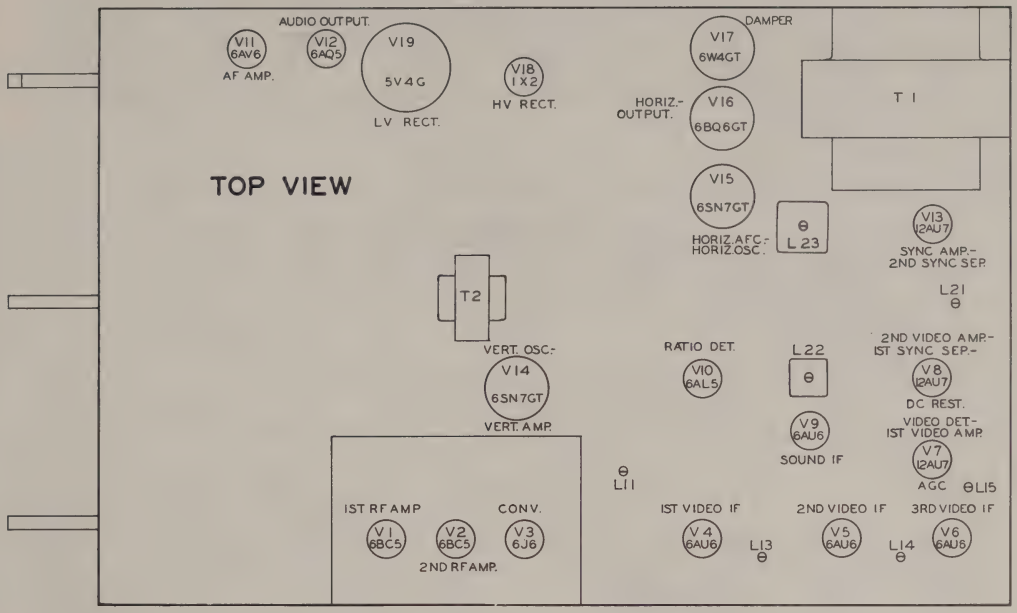
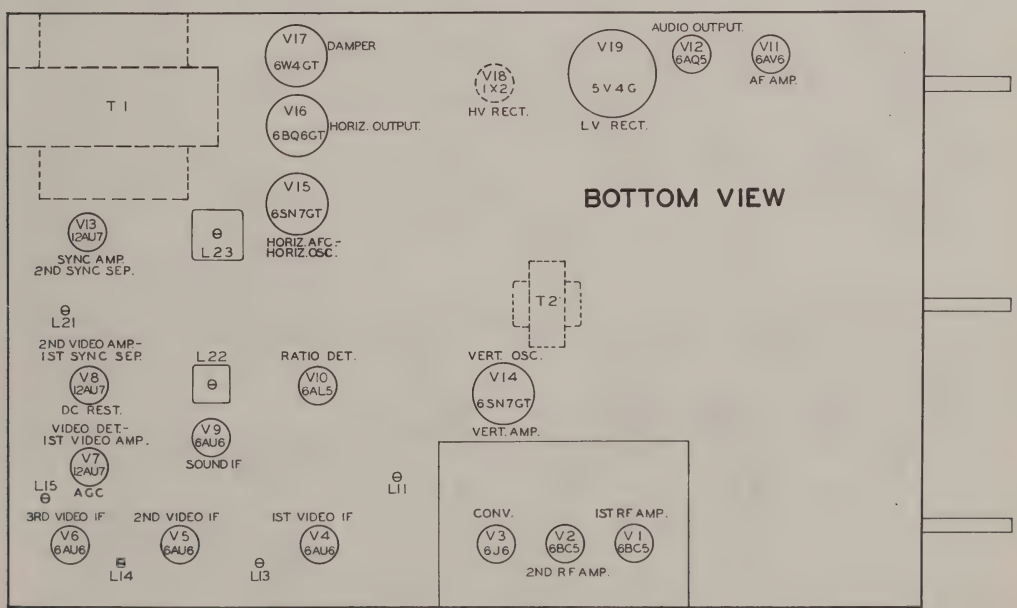


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal output tube (V16) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V3) from its socket and replace a 6J6 with pin 1 removed to prevent erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V3). Low side to chassis.	23.3MC	Any	DC Probe to Point (A). Common to chassis.	A1, A2	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -2 volts reading.
2.	Direct	"	25.9MC	"	"	A3	"
3.	Direct	"	25.5MC	"	"	A4	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V3). Low side to chassis.	24MC (10MC SWP)	21.75MC 26.25MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. The 26.25MC marker should be at 50% response. If necessary, slightly retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.05MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC	Any	DC Probe to Point (B). Common to chassis.	A5, A6, A7	Adjust for maximum deflection.
6.	.05MFD	"	"	"	DC Probe to Point (C). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.05MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A5, A6, A7	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per figure 2.
6.	.05MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A8	Reconnect capacitor C5. Adjust A8 to place 4.5MC at center of crossover lines as per figure 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

RF TUNER ALIGNMENT

Remove the dummy converter tube and replace with original 6J6.
Connect the negative terminal of a 3 volt battery to junction of R24 and C29 and the positive terminal to chassis.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
The two trimmer capacitors located near the front of the tuner are for the purpose of adjusting the antenna input circuit. These trimmers are preset at the factory and sealed, they should not be adjusted in the field.

HIGH BAND OSCILLATOR ALIGNMENT

Turn the range switch of the tuner to the "high" band position (counter-clockwise rotation).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	26.25MC 212.75MC	Tuning gang fully open	Vert. Amp. thru 10KΩ to Point (D). Low side to chassis.	A9	Adjust so 26.25MC and 212.75MC markers coincide at 100% on response curve as shown in figure 4.
8.	"	"	177MC (10MC SWP)	26.25MC 172.75MC	Tuning gang fully closed	"	L8	Expand or compress coil turns so 26.25MC and 172.75MC markers coincide at 100% on response curve as shown in figure 5. Repeat steps 7 and 8 until no further improvement can be made.

HIGH BAND RF ALIGNMENT

To set the tuning gang for step 9 inject a 26.25MC and 211.25MC marker and rotate tuning shaft until the 26.25MC and 211.25MC markers coincide on response curve.
To set the tuning gang for step 10 inject a 26.25MC and 175.25MC marker and rotate tuning shaft until the 26.25MC and 175.25MC markers coincide on the response curve.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	Set tuning gang as outlined above	Vert. Amp. to Point (D). Low side to chassis.	A10, A11	Adjust A10 for maximum amplitude at the 211.25MC point on the response curve. Adjust A-11 for maximum amplitude at the 215.75MC point on response curve.
10.	"	"	177MC (10MC SWP)	175.25MC 179.75MC	"	"	L4, L6	Expand or compress coil turns of L4 for maximum amplitude at the 175.25MC point on response curve. Adjust turns of L6 for maximum amplitude at the 179.75MC point on response curve. Repeat steps 9 and 10 until no further improvement can be made.

ALIGNMENT INSTRUCTIONS (CONT.)

LOW BAND OSCILLATOR ALIGNMENT

Turn the range switch of the tuner to the "low" band position (clockwise).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	26.25MC 84.75MC	Tuning gang fully open	Vert. Amp. thru 10KΩ to Point Ⓓ. Low side to chassis.	L7	Expand or compress coil turns so the 26.25MC and 84.75MC markers coincide at 100% response as shown in figure 6.
12.	"	"	57MC (10MC SWP)	26.25MC 54.25MC	Tuning gang fully closed	"	A12	Adjust so the 26.25MC and 54.75MC markers coincide at 100% response as shown in figure 7. Repeat steps 11 and 12 until no further improvement can be made.

LOW BAND RF ALIGNMENT

To set tuning gang in step 13, inject a 26.25MC and 83.25MC marker and rotate tuning shaft until the 26.25MC and 83.25MC markers coincide on response curve.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	83.25MC 87.75MC	Set tuning gang as outlined above	Vert. Amp. thru 10KΩ to Point Ⓓ. Low side to chassis.	L3, L5	Expand or compress coil turns of L3 for maximum amplitude at the 83.25MC point on response curve. Adjust turns of L5 for maximum amplitude at the 87.75MC point on response curve. Check all low band channels. If the markers fall below 70%, or the dip which may appear exceed 30% on any channel, a compromise adjustment of L3 and L5 will be required.

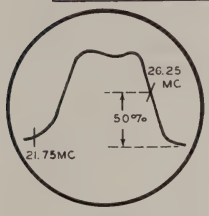


FIG.1

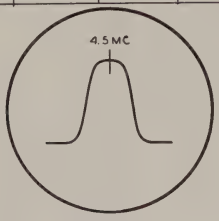


FIG.2

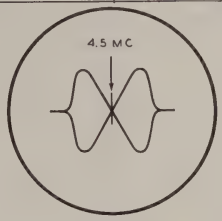


FIG.3

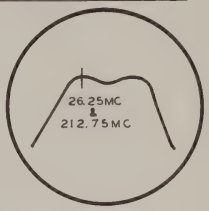


FIG.4

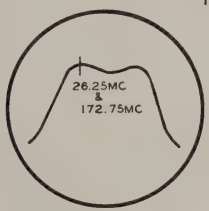


FIG.5

FIG.6

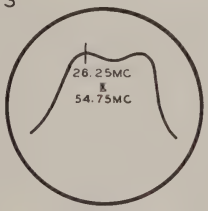


FIG.7

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.7VDC	0V.	6.3VAC	0V.	110VDC	110VDC	0V.		
V 2	6BC5	0V.	.9VDC	6.3VAC	0V.	155VDC	125VDC	.9VDC		
V 3	6J6	125VDC	85VDC	0V.	6.3VAC	§-2.7VDC	§-6.4VDC	0V.		
V 4	6AU6	-.2VDC	0V.	0V.	6.3VAC	125VDC	125VDC	.4VDC		
V 5	6AU6	-.2VDC	0V.	0V.	6.3VAC	125VDC	125VDC	.4VDC		
V 6	6AU6	0V.	0V.	0V.	6.3VAC	195VDC	125VDC	1VDC		
V 7	12AU7	-.4VDC	-.4VDC	0V.	6.3VAC	6.3VAC	105VDC	-.4VDC	0V.	0V.
V 8	12AU7	310VDC	0V.	20VDC	6.3VAC	6.3VAC	125VDC	0V.	10VDC	0V.
V 9	6AU6	-.6VDC	0V.	6.3VAC	0V.	320VDC	25VDC	0V.		
V 10	6AL5	0V.	0V.	6.3VAC	0V.	.2VDC	0V.	-.2VDC		
V 11	6AV6	-.2VDC	0V.	0V.	6.3VAC	0V.	0V.	80VDC		
V 12	6AQ5	#0V.	#8.8VDC	0V.	6.3VAC	#170VDC	#180VDC	#0V.		
V 13	12AU7	265VDC	0V.	15VDC	6.3VAC	6.3VAC	125VDC	0V.	5VDC	0V.
V 14	6SN7GT	-7VDC -6VDC	160VDC 40VDC	0V.	.2VDC	440VDC	0V. 22VDC	0V.	6.3VAC	
V 15	6SN7GT	-2.5VDC	200VDC 125VDC	-5.6VDC	-65VDC	185VDC	0V.	6.3VAC	0V.	
V 16	6BQ6GT	0V.	6.3VAC	440VDC	130VDC	-6.8VDC	320VDC	0V.	8.4VDC	TOP CAP *
V 17	6W4GT	400VDC	440VDC	440VDC	0V.	320VDC	190VDC	¶	¶	
V 18	1X2	* DO NOT MEASURE.								
V 19	5V4G	0V.	360VDC	0V.	330VAC	0V.	330VAC	0V.	360VDC	
V 20	12RP4	0V.	4VDC	PIN 10 320VDC	PIN 11 80VDC	PIN 12 6.3VAC				

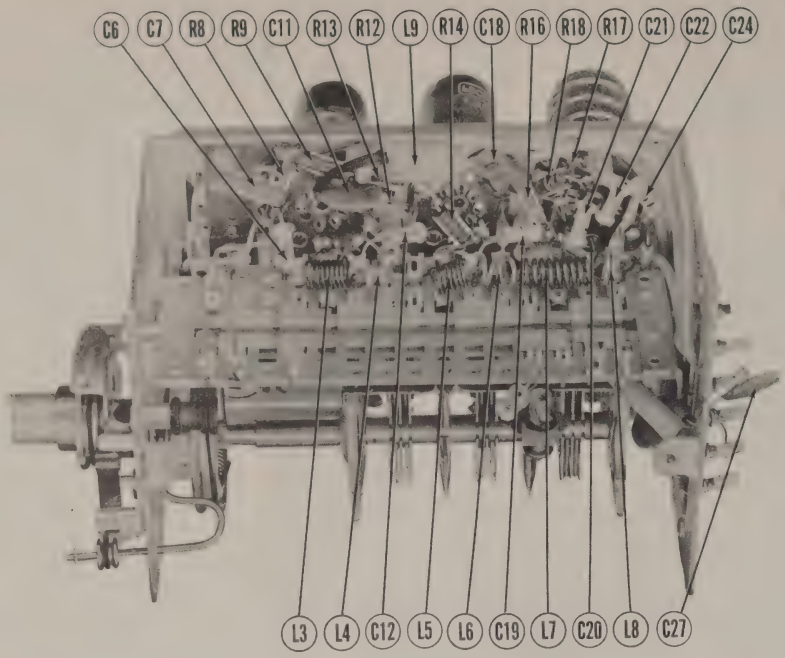
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
§ TAKEN WITH VACUUM TUBE VOLTEMTER.
# MEASURED FROM JUNCTION OF R56, R57, and R58.
¶ 6.3VAC MEASURED ACROSS FILAMENTS.
* DO NOT MEASURE.

RESISTANCE READINGS

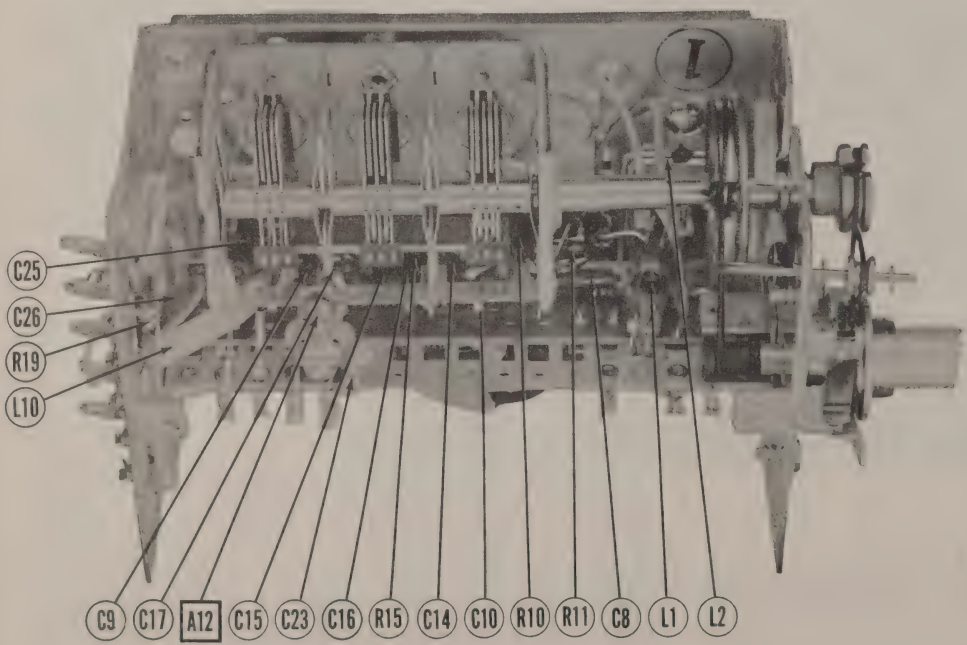
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	230KΩ	0Ω	.1Ω	0Ω	#1.3KΩ	#1.3KΩ	0Ω		
V 2	6BC5	10KΩ	100Ω	.1Ω	0Ω	#320Ω	#320Ω	100Ω		
V 3	6J6	#100Ω	#10KΩ	0Ω	.1Ω	105KΩ	10KΩ	0Ω		
V 4	6AU6	230KΩ	0Ω	0Ω	.1Ω	#.2Ω	#0Ω	47Ω		
V 5	6AU6	230KΩ	0Ω	0Ω	.1Ω	#100Ω	#100Ω	47Ω		
V 6	6AU6	.2Ω	0Ω	0Ω	.1Ω	†18KΩ	#200Ω	150Ω		
V 7	12AU7	10KΩ	10KΩ	.2Ω	.1Ω	.1Ω	#2.2KΩ	10KΩ	0Ω	0Ω
V 8	12AU7	†4.7KΩ	1 Meg.	10KΩ	.1Ω	.1Ω	#27KΩ	1 Meg.	330KΩ	0Ω
V 9	6AU6	33KΩ	0Ω	.1Ω	0Ω	†10KΩ	#50KΩ	0Ω		
V 10	6AL5	Inf.	Inf.	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 11	6AV6	4.7 Meg.	0Ω	0Ω	.1Ω	0Ω	0Ω	†470KΩ		
V 12	6AQ5	#100KΩ	#330Ω	0Ω	.1Ω	†565Ω	†200Ω	#100KΩ		
V 13	12AU7	†47KΩ	1 Meg.	10KΩ	.1Ω	.1Ω	#0Ω	2.4 Meg.	2.2KΩ	0Ω
V 14	6SN7GT	1 Meg. 2 Meg.	▲1 Meg. ▲3.5 Meg.	0Ω	2.2 Meg.	▲3.3KΩ	5KΩ 0Ω	0Ω	.1Ω	
V 15	6SN7GT	900KΩ	▲120KΩ ▲140KΩ	300KΩ	170KΩ	▲150KΩ	0Ω	.1Ω	0Ω	
V 16	6BQ6GT	Inf.	.1Ω	▲38Ω	†20KΩ	470KΩ	†200Ω	0Ω	100Ω	TOP CAP ▲125Ω
V 17	6W4GT	▲10KΩ	▲0Ω	200KΩ	Inf.	†200Ω	▲130KΩ	Inf.	Inf.	
V 18	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ▲385Ω
V 19	5V4G	Inf.	50KΩ	Inf.	42Ω	Inf.	42Ω	Inf.	50KΩ	
V 20	12RP4	0Ω	800KΩ	PIN 10 †200Ω	PIN 11 40KΩ	PIN 12 .1Ω				

FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
MEASURED FROM JUNCTION OF R56, R57, and R58.
† MEASURED FROM PIN 8 OF V19.
▲ MEASURED FROM PIN 3 OF V17.

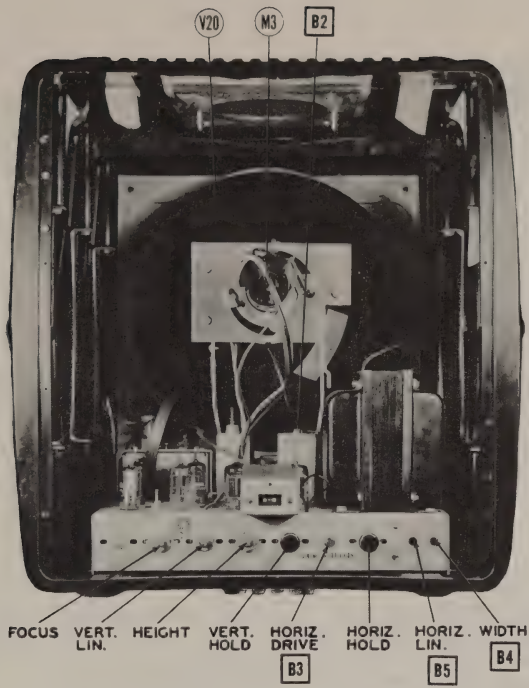
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENT

HORIZONTAL OSCILLATOR ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

If the adjustment of the top slug has been tampered with, turn the top slug (B2) out to its limit and adjust B1 until picture synchronizes.

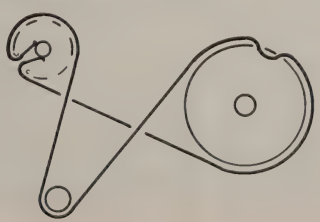
HORIZONTAL DRIVE, WIDTH AND LINEARITY ADJUSTMENTS

Turn the horizontal drive trimmer (B3) clockwise as far as possible without crowding the right side of the picture.

Adjust the width slug (B4) until picture fills the mask horizontally.

Adjust the horizontal linearity slug (B5) until picture is symmetrical from left to right. A slight readjustment of B3 may be necessary to obtain optimum results.

TUNING GANG FULLY CLOSED



FINE TUNING DIAL CORD STRINGING

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	1st RF Amp.	6BC5	6BC5	7BD	
B	1st RF Amp.	6AG5	6AG5	7BD	
V2A	2nd RF Amp.	6BC5	6BC5	7BD	
B	2nd RF Amp.	6AG5	6AG5	7BD	
V3	Converter	6J6	6J6	7BF	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	Video Det. -1st Video Amp. -AGC	12AU7	12AU7	9A	
V8	2nd Video Amp. - 1st Sync. Sep. DC Rest.	12AU7	12AU7	9A	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Det.	6AL5	6AL5	6BT	
V11	A/F Amp.	6AV5	6AV5	7BT	
V12	Audio Output	6AQ5	6AQ5	7BZ	
V13	Sync. Amp. -2nd Sync. Sep.	12AU7	12AU7	9A	
V14	Vert. Osc. -Vert. Amp.	6SN7GT	6SN7GT	8BD	
V15	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V16	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V17	Damper	6W4GT	5W4GT	4CG	
V18	HV Rect.	1X2	1X2	7CB	
V19	LV Rect.	5V4G	5V4G	5L	
V20A	Picture Tube	12BP4	12BP4	12D	Used in models 680, 681, 715.
B	Picture Tube	12LP4A	12LP4A	12D	Used in model 690.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450	45A150	PR3450/40-40		UP4445 §		TVA-2740	Filter-Red
B	40	450							Filter-Red
C2	60	450	45B166	PRTC450/60		UP3345 §		TVA-1613	Filter
C3A	10	450	45B157	AF2222J §		UPT11H45§		TVL-4830§	Decoupling-Red
B	10	450							Decoupling-Green
C	10	450							Output Cath.-Blue
D	10	450							Decoupling-Yellow
C4A	50	250	45B165	AFH650G §		UPT50255V 108		TVA-1511 TVA-1510	Decoupling-Red Vert. Amp. Cath.-Yel.
B	75	50				BR550		TVA-1303	Stabilizing Cap.
C5	5	50	45A108	PR2150/4			N750L-67	29C14	Filter-Red
C6	47		47X20CK500J	47X50/40-TC3Y-67					AGC Filter
C7	1500		47X50CJ152J	SI500			GP2L-0015	19C20	AGC Filter
C8	5000		47A168	BPD-005	DD-502		81L-005	29C1	1st RF Decoupling
C9	5000		47A168	BPD-005	DD-502		81L-005	29C1	1st RF Decoupling
C10	14		47X20CE140J				NPOE-14	19C20	Fixed Padder
C11	5000		47A168	BPD-005	DD-502		81L-005	29C1	1st RF Fil.
C12	100		47B201G1K5	SI100	D6-101		GPIK-100	19C11	RF Coupling
C13	4.7		47A160-6	SI4.7NPO	TC2-4.7		NPOK-4.7		RF Coupling †
C14	680			SI680	BPD-005		GPIK-680	19C17	2nd RF Cath.
C15	5000		47A168	BPD-005	DD-502		81L-005	29C1	2nd RF Dec.
C16	5000		47A168	BPD-005	DD-502		81L-005	29C1	2nd RF Dec.
C17	14		47X20CK140J				NPOK-14	19C20	Fixed Padder
C18	5000		47A168	BPD-005	DD-502		81L-005	29C1	2nd RF Fil.
C19	100		47B201G1K5	SI100	D6-101		GPIK-100	19C11	RF Coupling
C20	2.2		47X20CK022J		TC2-2.2				Osc. Coupling
C21	33		47X20CK330J	SI33	D6-330		GPIK-33	19C24	Osc. Grid Cap.
C22	17 5		47X20CK180J				N470K-17.5		Fixed Trimmer
C23	10			SI10NPO	TC2-10		NPOK-10	19C3	Fixed Trimmer
C24	10			SI10NPO	TC2-10		NPOK-10	19C3	Fixed Trimmer
C25	19		47X20CK190J				NPOK-19		Fixed Padder
C26	5000		47A168	BPD-005	DD-502		81L-005	29C1	RF Bypass
C27	5000		47A168	BPD-005	DD-502		81L-005	29C1	Mixer Plate Dec. †
C28	100		47B201G1K5	SI100	D6-101		GPIK-100	19C11	IF Coupling †
C29	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	AGC Filter
C30	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	1st V. IF Dec.
C31	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	AGC Filter
C32	3.3			SI3.3NPO	TC2-3.3		NPOK-3.3		Fixed Trimmer †
C33	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	2nd V. IF Dec.
C34	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	3rd V. IF Screen
C35	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	3rd V. IF Cath.
C36	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	3rd V. IF Plate Dec.
C37	5		47X20U250M	SI5	TC2-4.7	5W5V5	GPIK-5	M8-55	V. Diode Filter
C38	25	200	46A7254J	P488-25		GT2P25		27M-2	AGC Filter
C39	50	200	46A1503J	P288-50	DF-503	PTE4S		27M-15	Video Coupling
C40	56	500	47X20A560M	SI56		5W5Q5	GPIK-56	1FM-45	2nd V. Amp. Cath.
C41	47				TC2-47		NPOM-47	19C14	Fixed Trimmer
C42	22	500	47X20A220K		NPO2-22		NPOE-22	29C12	Fixed Trimmer
C43	.1	600	46A7104J	P388-1		DF-104	PTE4P1	67M-1	Video Coupling
C44	.02	200	46A1203J	P488-02		DF-203	PTE4S2	27M-13	Video Coupling
C45	.25	200	46A7254J	P488-25			GT2P25	27M-2	Sync. Sep.-DC Rest. Cath.
C46	.1	200	46A1043J	P288-1		DF-104	PTE4P1	27M-1	Ptc. Tube Cath.
C47	100		47B201G1K5	SI100	D6-101	5W5T1	GPIK-100	19C11	S. IF Coupling
C48	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	S. IF Screen
C49	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	S. IF Plate Dec.
C50	330		47B2033K1S	SI330	D6-331	5W5T3	GPIK-330	19C14	Diode Load Cap. *
C51	330		47B2033K1S	SI330	D6-331	5W5T3	GPIK-330	19C14	Diode Load Cap. *
C52	1000		47B2102M5	SI1000	D6-102	1W5D1	GP2L-001	19C1	De-emphasis
C53	.01	200	46A1103J	P488-01	D6-103	PTE4S1	81L-01	29C1	Audio Coupling
C54	.01	200	46A1103J	P488-01	D6-103	PTE4S1	81L-01	29C1	Audio Coupling
C55	330	500	47X20A331M	SI330	D6-331	5W5T3	GPIK-330	19C14	A/F Amp. Plate
C56	.01	600	46A7103J	P688-01	D6-103	PTE6S1	81L-01	67M-11	Audio Coupling
C57	.01	600	46A7103J	P688-01	D6-103	PTE6S1	81L-01	67M-11	Output Plate Byp.

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C58	.01	200	46A1103J	P488-01	D6-103	PTE4S1	81L-01	67M-11	Sync. Coupling
C59	.1	200	46A1104J	P288-1	DF-104	PTE4P1		27M-1	Sync. Amp. Cath.
C60	100		47B201G1K5	SI100	D6-101	5W5T1	GPIK-100	19C11	Sync. Coupling
C61	1000	500	47X20A102M	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Sync. Sep. Cath.
C62	.002	600	46A2203J	P688-002	D6-203	PTE6S2	GP2M-002	67M-23	Integrator Net.
C63	.005	200	46A5052J	P688-005	D6-502	PTE6S5	81L-005	67M-25	Integrator Net.
C64	.005	200	46A5052J	P688-005	D6-502	PTE6S5	81L-005	67M-25	Integrator Net.
C65	4700	500	47X35A472M	1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid
C66	.1	600	46A7104J	P688-1		PTE6P1		67M-1	Vert. Discharge
C67	.25	600	46A7254J	684-25		GT6P25		67M-2	Hor. Sweep Coupling
C68	180	500	47X20 A181M	1468-0002	D6-181	5W5T2	GP2K-180	1FM-32	Hor. Sync. Coupling
C69	220	500	47X20A221M	1468-0002	D6-221	5W5T2	GP2K-220	1FM-32	Voltage Divider
C70	.002	600	46A2202J	P688-002	D6-202	PTE6D2	GP2M-002	67M-22	Hor. Sync. Coupling
C71	.25	200	46A7254J	P488-25		GT2P25		27M-2	AFC Filter
C72	.02	600	46A7203J	P688-02	DF-203	PTE6S2		67M-23	AFC Filter
C73	.1	600	46A7104J	P688-1	DF-104	PTE6P1		67M-1	Hor. AFC Plate Byp.
C74	390	500	47X20A391M	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. Osc. Grid
C75	10000	500	47X35A103M	1467-01		1D3B1		1FM-11	Fixed Trimmer
C76	1000	500	47X20A102M	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Discharge
C77	1000	500	47X20A102M	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sweep Coupling
C78	390	500	47X20A391M	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Voltage Divider
C79	.25	200	46A7254J	P488-25		GT2P25		27M-2	Hor. Output Cath.
C80	1000	500	47X20A102M	SI1000	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Output Cath.
C81	.05	600	47A7503J	P688-05	DF-503	PTE6S5		67M-15	Hor. Output Screen
C82	1000		47B20A102M5	SI1000	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Output Screen
C83	5		47X20U250M	SI5	TC2-4.7	5W5Y5	GPIK-5	M8-55	Hor. Feedback
C84	68		47B20680K5	SI68	D6-680	5W5Q7	GPIK-68	19C10	Hor. Feedback
C85	68		47B20680K5	SI68	D6-680	5W5Q7	GPIK-68	19C10	Hor. Feedback
C86	.1	600	46A7104J	P688-1		PTE6P1		67M-1	Damper Filter †
C87	.035	600	46A7352J	P688-033					Damper Filter
C88	1000		47B20A102M5	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Bypass
C89	.05	600	46A7503J	P688-05		PTE6S5		67M-15	Fixed Trimmer
C90	1000		47B20A102M5	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Bypass
C91	.1	200	46A1104J	P288-1		PTE6P1		27M-1	Hor. Sweep Coupling
C92	500	20000	47A216	BYP20-5		TV2-502			HV Filter
C93	5000		47A168	BPD-005	DD-502	1DSD5	81L-005	29C1	Filament Bypass †
C94	.01	600	46BR103L6	P688-01	D6-103	PTE6S1	81L-01	67M-11	Line Filter
C95	.01	600	46BR103L6	P688-01	D6-103	PTE6S1	81L-01	67M-11	Line Filter
C96	1000	500	47X20A102M	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Ant. Coupling

* When either items C50 or C51 are replaced, replace both with capacitors of equal value.
† Not used in all models.
§ Some models use .05MFD in this application.
$ Use mounting strap.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Hallicrafters	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	50KΩ	1	25B874	Concentrikit BT-123 *	RTV-72	SBB-643	Brightness control-front
B	1 Meg.	1		BT-137 *			Volume control-rear
C	Shaft End			E-202 *			Attach per instr. in "Concentrikit".
R2A	10KΩ	2	25B790	WK-10, 000	RTV-24		Contrast control-Wire Wound
B	Switch		Not Req.	S2	Not Req.		Attach to R2A per instructions
R3	2500Ω	½	25B710	WK-2500	RTV-73	VK-132	Focus control-Wire Wound
R4A	5000Ω	½	25B712	QII-114	AM-19-5	AN-10	Vert. linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5A	2.5 Meg.	½	25B711	QII-239	AG-84-5	AN-83	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	Meg.	½	25A857	QII-137	AG-61-5	AN-89	Vert. hold control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	50KΩ	½	25B858	QII-123	AG-44-5	AN-31	Horiz. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R7A per instructions

* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: IRC PART NO.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	560Ω	½	33X20X561K	BTS-560	1st RF Amp. Grid
R9	150Ω 20%	½	33X20X151M	BTS-150	AGC Network
R10	1000Ω	½	33X20X102K	BTS-1000	1st RF Amp. Screen
R11	1200Ω	½	33X20X122K	BTS-1200	RF Coil Shunt
R12	10KΩ	½	33X20X103K		2nd RF Amp. Grid
R13	100Ω 20%	½	33X20X101M	BTS-100	2nd RF Amp. Cathode
R14	220Ω 20%	½	33X20X221M	BTS-220	Screen Dropping
R15	1500Ω	½	33X20X152K	BTS-1500	RF Coil Shunt
R16	5600Ω	½	33X20X562K		Mixer Grid
R17	100KΩ 20%	½	33X20X104M		Mixer Grid
R18	10KΩ	½	33X20X103K		AGC Network
R19	10KΩ	½	33X20X103K		Mixer Plate Decoupling
R20	100Ω	½	33X20X101K	BTS-100	Decoupling
R21	5600Ω	½	33X20X562K		1st Video IF Transformer Shunt-See Note 1
R22	15KΩ	½	33X20X153K		1st Video IF Amp. Grid-See Note 1
R23	47KΩ	½	33X20X473K		1st Video IF Amp. Cathode
R24	150Ω	½	33X20X151K	BTS-150	AGC Network
R25	33KΩ	½	33X20X333K		2nd Video IF Transformer Shunt-See Note 2
R26	100Ω	½	33X20X101K	BTS-100	2nd Video IF Amp. Decoupling
R27	47Ω	½	33X20X470K		2nd Video IF Amp. Cathode
R28	150Ω	½	33X20X151K	BTS-150	AGC Network
R29	3300Ω	½	33X20X332K	BTS-3300	2nd Video IF Transformer Shunt-See Note 2
R30	150Ω	½	33X20X151K	BTS-150	3rd Video IF Amp. Cathode
R31	100Ω	½	33X20X101K	BTS-100	3rd Video IF Amp. Screen
R32	18KΩ	½	33X20X183K		3rd Video IF Amp. Plate Decoupling
R33	220KΩ 20%	½	33X20X224M	BTS-220K	AGC Network
R34	10KΩ	½	33X20X103K	BTS-10K	Video Det. Load
R35	22KΩ	½	33X20X223K	BTS-22K	Peaking Coil Shunt

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: IRC PART NO.	IDENTIFICATION CODES
R36	2200Ω	1	33X30X222K	BTA-2200	1st Video Amp. Plate
R37	1 Meg. 20%	½	33X20X105M	BTS-1 Meg.	2nd Video Amp. Grid
R38	330KΩ 20%	½	33X20X334M	BTS-330K	DC Rest. Load
R39	47KΩ	½	33X20X473K	BTS-47K	1st Sync. Sep. Grid
R40	1 Meg. 20%	½	33X20X105M	BTS-1 Meg.	1st Sync. Sep. Grid
R41	470KΩ 20%	½	33X20X474M	BTS-470K	Picture Tube Grid
R42	27KΩ	½	33X20X273K	BTS-27K	1st Sync. Sep. Plate
R43	4700Ω	2	33X40X472K	BTB-4700	2nd Video Amp. Plate
R44	180KΩ 20%	½	33X20X184M	BTS-180K	Voltage Divider
R45	13KΩ	½	33X20X133K	BTS-13K	Voltage Divider
R46	33KΩ	½	33X20X333K		Sound IF Amp. Grid
R47	47KΩ	½	33X20X473K		Voltage Divider
R48	100KΩ	½	33X20X104K		Sound IF Amp. Screen
R49	10KΩ	½	33X20X103K		Sound IF Amp. Plate Decoupling
R50	15KΩ	½	33X20X153K	BTS-150	Balancing
R51	10KΩ	½	33X20X103K	BTS-10K	Ratio Det. Diode Load
R52	10KΩ	½	33X20X103K	BTS-10K	Ratio Det. Diode Load
R53	33KΩ	½	33X20X333K	BTS-33K	De-emphasis
R54	4.7 Meg.5%	½	33X20X475M	BTS-4.7 Meg.	A/F Amp. Grid
R55	470KΩ 10%	½	33X20X474M	BTS-470K	A/F Amp. Plate
R56	100KΩ	½	33X20X104K	BTS-100K	Audio Output Grid
R57	330Ω	1	33X30X331K	BTA-330	Audio Output Cathode
R58	5000Ω	10	54DG50E	1.5/4A-5000	Filter-Wire Wound
R59	1 Meg. 20%	½	33X20X105M	BTS-1 Meg.	Sync. Amp. Grid
R60	10KΩ	½	33X20X103K	BTS-10K	Sync. Amp. Cathode
R61	2.2 Meg.20%	½	33X20X225M	BTS-2.2 Meg.	2nd Sync. Sep. Grid
R62	2200Ω	½	33X20X222K	BTS-2200	2nd Sync. Sep. Cathode
R63	22KΩ	½	33X20X223K	BTS-22K	Integrator
R64	8200Ω	½	33X20X822K	BTS-8200	Integrator
R65	8200Ω	½	33X20X822K	BTS-8200	Integrator
R66	1 Meg. 20%	½	33X20X105M	BTA-1 Meg.	Vert. Osc. Grid
R67	1 Meg.	½	33X20X105K	BTA-1 Meg.	Vert. Osc. Plate
R68	3300Ω	½	33X20X332K	BTS-3300	Vert. Peaking
R69	2.2 Meg. 20%	½	33X20X225M	BTS-2.2 Meg.	Vert. Amp. Grid
R70	2200Ω	1	33X30X222K	BTA-2200	Decoupling
R71	47KΩ	½	33X20X473K	BTS-47K	Sync. Amp. Plate
R72	820KΩ	½	33X20X824K	BTS-820K	Horiz. AFC Grid
R73	2.7 Meg.	½	33X20X275K	BTA-2.7 Meg.	Integrator
R74	8200Ω	½	33X20X822K	BTS-8200	Horiz. AFC Filter Network
R75	150KΩ	½	33X20X154K	BTS-150K	Horiz. AFC Cathode
R76	150KΩ	½	33X20X154K	BTA-150K	Horiz. AFC Cathode
R77	82KΩ	½	33X20X823K	BTS-82K	Voltage Divider
R78	120KΩ	½	33X20X124K	BTS-120K	Voltage Divider
R79	120KΩ 5%	½	33X30X124J	BTA-120K-5%	Horiz. Osc. Grid
R80	8200Ω	½	33X20X822K	BTS-8200	Horiz. Osc. Transformer Shunt
R81	22KΩ	½	33X20X223K	BTS-22K	Horiz. Osc. Transformer Shunt
R82	120KΩ 5%	½	33X30X124J	BTA-120K-5%	Horiz. Osc. Plate
R83	150KΩ	½	33X20X154K	BTS-150K	Horiz. Osc. Filter Network
R84	10KΩ	½	33X20X103K	BTA-10K	Decoupling
R85	560KΩ 20%	½	33X20X564M	BTS-560K	Feedback
R86	470KΩ 20%	½	33X20X474M	BTS-470K	Horiz. Output Grid - Parasitic Suppressor
R87	47Ω	½	33X20X470K		Horiz. Output Cathode
R88	100Ω	1	33X30X10K	BTA-100	Horiz. Output Screen-Wire Wound
R89	39KΩ	2	33D40X393K	BTB-39K	Horiz. Output Screen-Wire Wound
R90	39KΩ	2	33X40X393K	BTB-39K	Parasitic Suppressor-See Note 3
R91	39Ω 20%	1	33X20X390M		HV Filter
R92	1 Meg. 20%	1	33X30X105M		HV Filter
R93	200Ω	2	34BE92E	2D-200	Filter-Wire Wound

Note 1. Not used in all models.
Note 2. Some models use a 10KΩ resistor in this application.
Note 3. Some models use a 33Ω, 1 watt resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: HALLICRAFTER PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ② 1.5A	660VCT ③ 180ADC	5VAC ④ 3A	6.3VAC ④ 1.2A SEC. 4 6.3VAC ⑤ 7.2A	52C185		P-3169	TF-370 ⑥

⑥ Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	HALLICRAFTER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	200Ω	1200Ω	55B115	A-8111	A-3000	TSO-1	Vert. Block Osc. Trans.
T3	34Ω 48Ω	5Ω SEC. 2 2Ω, 4.1Ω SEC. 3 0Ω	55C133		HVO-6		Hor. Output Trans.
T4	1100Ω		55B128	A-3037		TSO-5	Vert. Output Trans.
T5A	Tap ②	12.5Ω					
T5A	14Ω		53A180	DY-1	MD-3		Hor. Deflection Coil
B	68Ω						Vert. Deflection Coil
T6A	1300Ω		51B1173 ① 51B1158 ②				Focus Coil
B							Focus Coil

① Used in models 680, 681, 715.
② Used in models 690.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		Hallicrafters	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T7	6600Ω	3.5Ω	365Ω	.5Ω	55C134	A-3877	A-2931	RO-13 ④	④ Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA				NOTES
			HALLICRAFTER	JENSEN	QUAM		
	FIELD RES.	V. C. IMP.	PART No.	PART No.	PART No.		
SP1A	PM	3.5Ω	85C101 ①		5A07		① Used in models 680, 681, 715
B	PM	3.5Ω	85C098 ②				② Used in models 690
	CONE DIA.	V. C. DIA.					
SP2A	4 1/2"	9/16"					
B	6"						

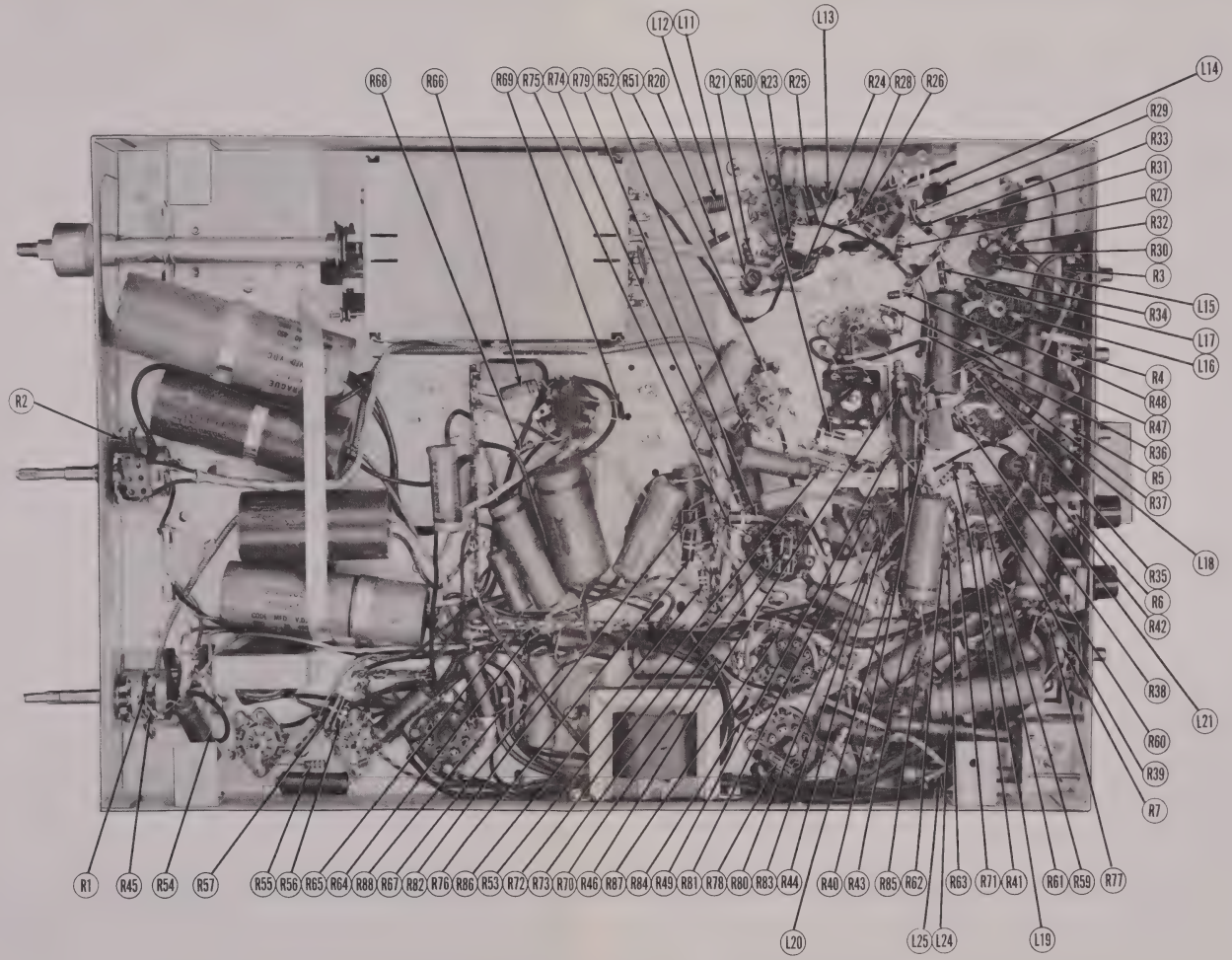
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
				HALLICRAFTER	MEISSNER	
		PRI.	SEC.	PART No.	PART No.	
L1	Ant. Coil	0Ω	0Ω	*		Low Band
L2	Ant. Coil	0Ω	0Ω	*		High Band
L3	RF Coil	0Ω		*		Low Band
L4	RF Coil	0Ω		*		High Band
L5	RF Coil	0Ω		*		Low Band
L6	RF Coil	0Ω		*		High Band
L7	Osc. Coil	0Ω		*		Low Band
L8	Osc. Coil	0Ω		*		High Band
L9	Fil. Choke	0Ω		*		
L10	RF Choke	.2Ω		*		
L11	1st Video IF	.2Ω	.2Ω	50A431		Replaced by part #50B452 in some models.
L12	Fil. Choke	0Ω				
L13	2nd Video IF	.2Ω	.2Ω	50A431		
L14	3rd Video IF	.2Ω	.2Ω	50A431		
L15	4th Video IF	.2Ω	.2Ω	50A431		
L16	Peaking	8.7Ω		51A1154		Wound on 1 Meg. resistor
L17	Peaking	13Ω		51A1155		Wound on 1 Meg. resistor
L18	Peaking	8.7Ω		51A1154		Wound on 1 Meg. resistor
L19	Peaking	13Ω		51A1155		Wound on 1 Meg. resistor
L20	Peaking	8.7Ω		51A1154		Wound on 1 Meg. resistor
L21	Sound IF	.8Ω	.7Ω	50A432		
L22	Ratio Det. Trans.	4.5Ω	.8Ω	50B406		
L23	Horiz. Osc. Trans.	135Ω	40Ω	51B1153		
L24	Horiz. Lin.	38Ω		51B1071		
L25	Width Coil	.1Ω		51B1072-1		
L26	AC Line Choke	.2Ω		52B009		
L27	AC Line Choke	.2Ω		53B009		

* Part of tuner #1X945.

MISCELLANEOUS

ITEM No.	PART NAME	HALLICRAFTERS PART No.	NOTES
M1	RF Tuner	1X945	
M2	Fuse	39A345	4A 250V SLO BLO
M3	Ion Trap	21A093	
	Safety Glass	22D283	Model 715
	Safety Glass	22A260	Model 690
	Safety Glass	22D291	Model 681
	Safety Glass	22D290	Model 680
	Knob	15B223	Channel selector
	Knob	15B225	Range switch
	Knob	15B228	Volume
	Knob	15B227	Brightness, Model 715
	Knob	15A236	Brightness, Models 690, 681, 680
	Knob	16C226	Off-Contrast Model 715
	Knob	15B235	Off-Contrast Models 690, 681, 680



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

MASCO
MODEL MA-10EX

MASCO MODEL MA-10EX

TRADE NAME	Masco, Model MA-10EX
MANUFACTURER	Mark Simpson Mfg. Co. Inc., 32-28 49th St., Long Island City 3, New York
TYPE SET	AC Operated Audio Amplifier
TUBES (SEVEN)	Types 6SL7GT 1st AF Amp.-DC Amp., 6SL7GT Expander Amp.-Rectifier, 6SC7 Pre Amp., 6SL7GT 2nd AF Amp.-Phase Inverter, (2) 6V6GT Power Output, 5Y3GT Rectifier
POWER SUPPLY	105-125 Volts AC RATING .65 Amp. at 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

MASCO
MODEL MA-10EX

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		MASCO PART No.	STANDARD REPLACEMENT		
V1	1st AF Amp. -DC Amp.	6SL7GT	6SL7GT	8BD	
V2	Expander Amp. - Expander Rect.	6SL7GT	6SL7GT	8BD	
V3	Pre-Amp.	6SC7GT	6SC7GT	8S	
V4	2nd AF Amp. - Phase Inv.	6SL7GT	6SL7GT	8BD	
V5	Power Output	6V6GT	6V6GT	7AL	
V6	Power Output	6V6GT	6V6GT	7AL	
V7	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

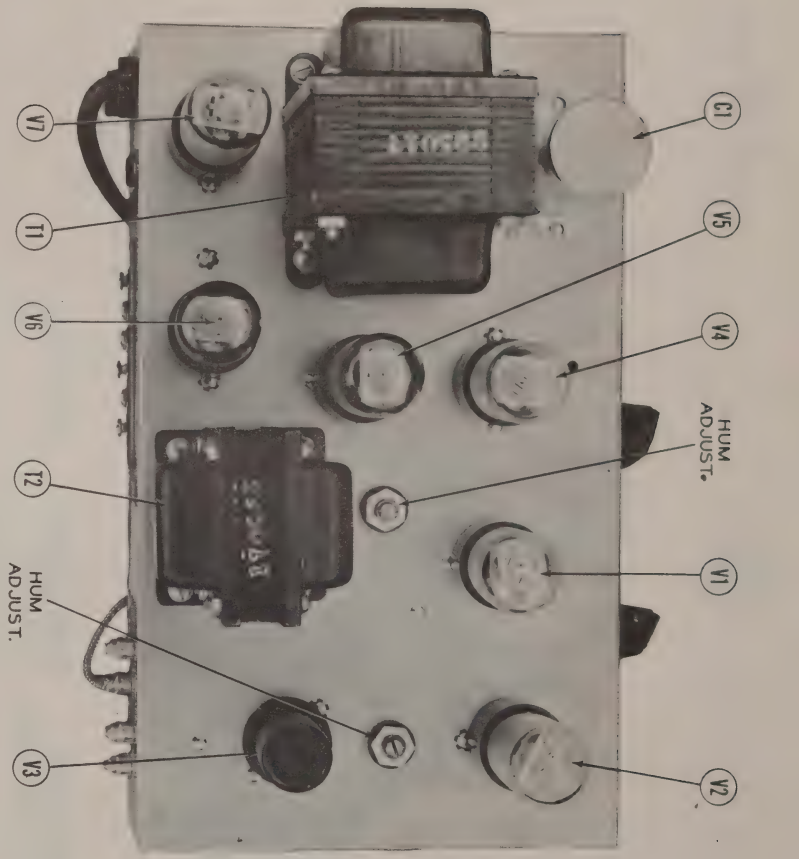
ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MASCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	20	450		AF444J		UP22245		TVL-3780	▲ Filter
B	20	450							■ Filter
C	10	450							▲ Filter
C2	8	450		PRS450/8		BR845A		TVA-1704	Decoupling
C3	10	50		PRS50/10		BR105		TVA-1304	Expander Amp. Cath.
C4	50	50		PRS50/50		BR505		TVA-1308	2nd AF Amp. Cath.
C5	50	50		PRS50/50		BR505		TVA-1308	Output Cath. Byp.
C6	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Audio Coupling
C7	.1	200		P288-1	DF-104	PTE4P1		2TM-P1	Expander Filter
C8	.5	200		P288-5		GT2P5		2TM-P5	Expander Filter
C9	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Expander Filter
C10	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C11	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C12	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Pre-Amp. Dec.
C13	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Pre-Amp. Dec.
C14	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C15	.01	600		P688-01	D6-103	PTE6S1	811-01	6TM-S1	Audio Coupling
C16	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C17	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C18	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Tone Compensation
C19	.005	600		P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Compensation
C20	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Line Filter

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MASCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½		Q13-133	AM-60-Z	B-60-S	Volume control
B	Shaft			Not Req.	RS-2	Not Req.	Attach to R1A per instructions
C	Switch			76-1	SW-A	Not Req.	Attach to R1A per instructions
R2A	500KΩ	½		Q13-133	AM-60-Z	B-60-S	Expander control
B	Shaft			Not Req.	RS-2	Not Req.	Attach to R2A per instructions
C	Switch			76-1	SW-A	Not Req.	Attach to R2A per instructions
R3	50Ω	1		W-50	43-50 *	VK-116	Hum control-Wire Wound
R4	50Ω	1		W-50	43-50 *	VK-116	Hum control-Wire Wound

* File slot in shaft to duplicate original.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MASCO PART No.	IRC PART No.	
R5	270KΩ	½		BTS-270K	Isolation
R6	270KΩ	½		BTS-270K	Isolation
R7	2200Ω	½		BTS-2200	1st AF Amp. Cathode
R8	150KΩ	½		BTS-150K	1st AF Amp. Plate
R9	270KΩ	½		BTS-270K	DC Amp. Plate
R10	2200Ω	½		BTS-2200	Expander Amp. Cathode
R11	100KΩ	½		BTS-100K	Expander Amp. Plate
R12	100KΩ	½		BTS-100K	Expander Rect. Load
R13	1 Meg.	½		BTS-1 Meg.	Expander Rect. Load
R14	100KΩ	½		BTS-100K	Expander Network
R15	270KΩ	½		BTS-270K	Expander Network
R16	100KΩ	½		BTS-100K	Tone Compensation
R17	4700Ω	½		BTS-4700	Pre Amp. Input Shunt
R18	27KΩ	½		BTS-27K	Pre Amp. Input Shunt
R19	1 Meg.	½		BTS-1 Meg.	Pre Amp. Grid
R20	10KΩ	½		BTS-10K	Pre Amp. Plate
R21	47KΩ	½		BTS-47K	Pre Amp. Plate Decoupling
R22	1 Meg.	½		BTS-1 Meg.	Pre Amp. Grid
R23	10KΩ	½		BTS-10K	Pre Amp. Plate
R24	47KΩ	½		BTS-47K	Pre Amp. Plate Decoupling
R25	15 Meg.	½		BTS-15 Meg.	Voltage Divider
R26	270KΩ	½		BTS-270K	Tone Compensation
R27	150KΩ	½		BTS-150K	2nd AF Amp. Grid
R28	470Ω	½		BTS-470	2nd AF Amp. Cathode
R29	1500Ω	½		BTS-1500	2nd AF Amp. Cathode
R30	100KΩ	½		BTS-100K	2nd AF Amp. Plate
R31	1500Ω	½		BTS-1500	Phase Inv. Cathode
R32	100KΩ	½		BTS-100K	Phase Inv. Plate
R33	10KΩ	½		BTS-10K	Phase Inv. Grid
R34	270KΩ	½		BTS-270K	Output Grid
R35	270KΩ	½		BTS-270K	Output Grid
R36	250Ω	10		1 3/4A-250	Output Cathode-Wire Wound
R37	3600Ω	½			Tone Compensation-See Note 1
R38	3600Ω	½			Tone Compensation-See Note 1
R39	4700Ω	½		BTS-4700	Tone Compensation
R40	100KΩ	½		BTS-100K	Pre Amp. Decoupling
R41	10KΩ	½		BTS-10K	Filter
R42	2700Ω	1		BW-1-2700	Filter

Note 1. Some models use a 3300Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .65A	660VCT .075ADC	5VAC @ 2A	6.3VAC @ 2.1A	P-8	P-4079 ①	P-3152 ①	PV-90 ①

① Drill new mounting holes.

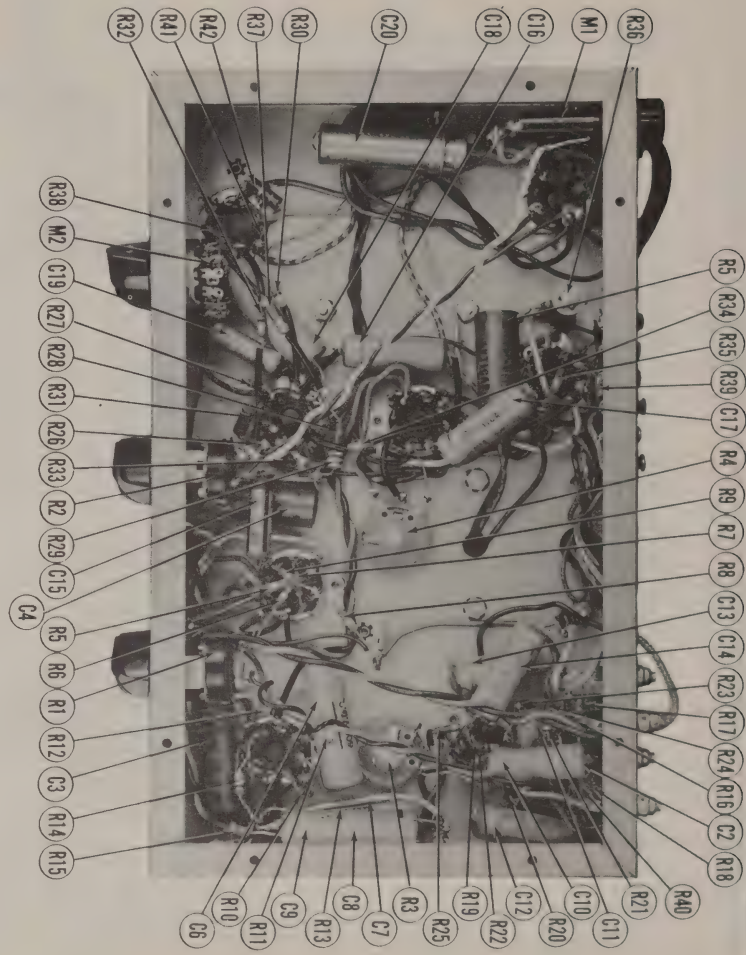
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MASCO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	6200Ω CT	2Ω 4Ω 8Ω 15Ω 500Ω	1000Ω CT	.28Ω .3Ω .4Ω .5Ω 22Ω	0-17E				

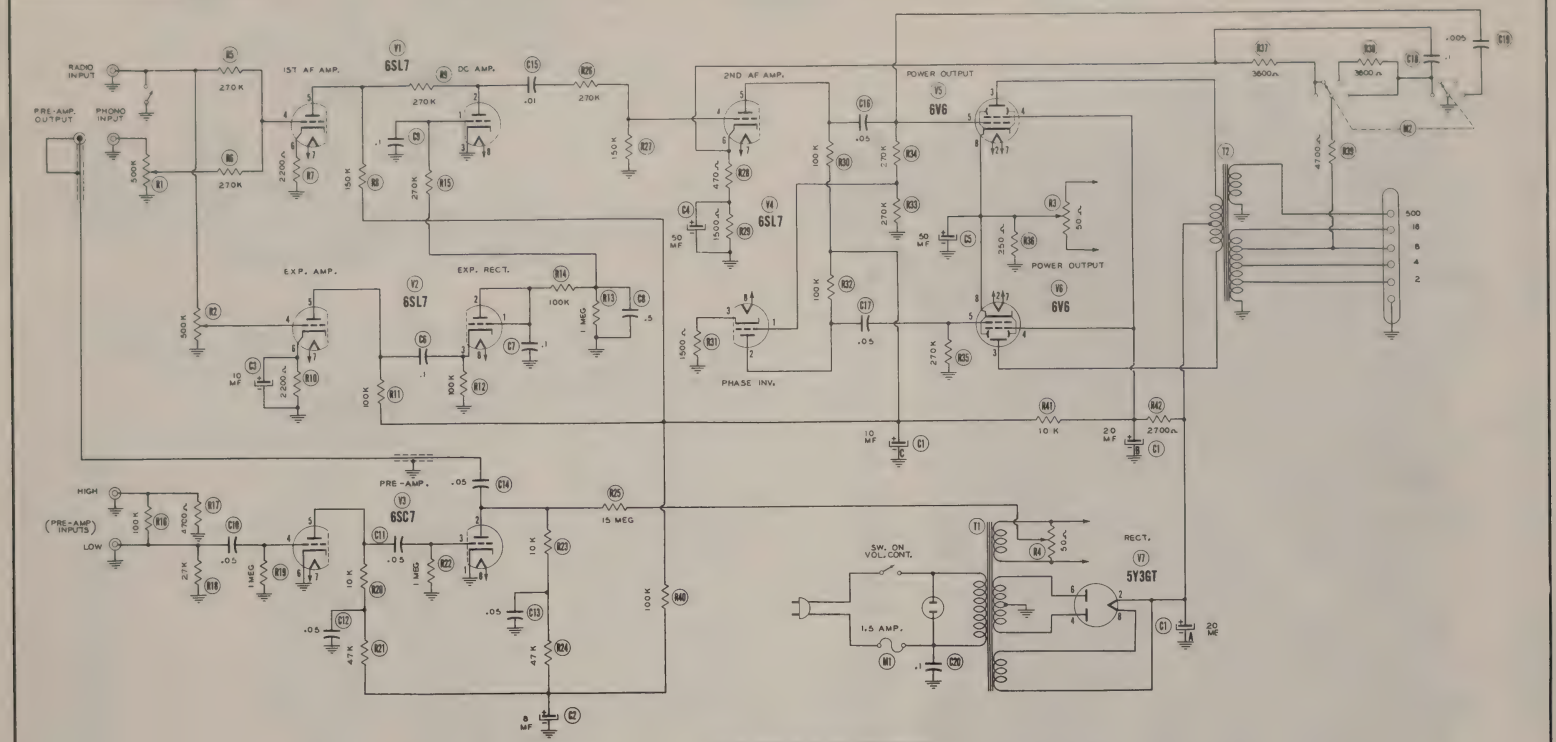
MISCELLANEOUS

ITEM No.	PART NAME	MASCO PART No.	NOTES
M1	Fuse		1.5 Amp., Type 3AG
M2	Switch		Tone

CHASSIS—BOTTOM VIEW



MASCO
MODEL MA-10EX



SELECTOR SWITCH SET FOR RADIO INPUT OPERATION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SL7GT	-.6VDC	55VDC	0V.	0V.	110VDC	1.4VDC	¶	¶
V 2	6SL7GT	-.5VDC	-.5VDC	.2VDC	0V.	155VDC	2VDC	¶	¶
V 3	6SC7	0V.	75VDC	-.4VDC	.4VDC	75VDC	0V.	¶	¶
V 4	6SL7GT	0V.	140VDC	1.6VDC	0V.	140VDC	61.6VDC ▲1.6VDC	¶	¶
V 5	6V6GT	0V.	¶	315VDC	300VDC	0V.	140VDC 300VDC	¶	20VDC
V 6	6V6GT	0V.	¶	315VDC	300VDC	0V.	300VDC ▲1VDC	¶	20VDC
V 7	5Y3GT	0V.	320VDC	0V.	305VAC	0V.	305VAC	0V.	320VDC

¶ 6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SL7GT	1.3 Meg.	†430KΩ	0Ω	270KΩ	†168KΩ	2.2KΩ	250Ω	250Ω
V 2	6SL7GT	1 Meg.	1 Meg.	100KΩ	0Ω	†115KΩ	2.2KΩ	250Ω	250Ω
V 3	6SC7	0Ω	†170KΩ	1 Meg.	1 Meg.	†170KΩ	0Ω	250Ω	250Ω
V 4	6SL7GT	10KΩ	†115KΩ	1.5KΩ	150KΩ	†115KΩ	#28KΩ ▲1.7KΩ	250Ω	250Ω
V 5	6V6GT	0Ω	250Ω	†500Ω	†2.7KΩ	280KΩ	†115KΩ #4.7KΩ	250Ω	250Ω
V 6	6V6GT	0Ω	250Ω	†500Ω	†2.7KΩ	270KΩ	#2.7KΩ ▲2.7KΩ	250Ω	250Ω
V 7	5Y3GT	Inf.	50KΩ	Inf.	150Ω	Inf.	150Ω	Inf.	50KΩ

TAKEN IN BASS OR MEDIUM BASS POSITION
▲ TAKEN IN NORMAL OR TREBLE POSITION.
† MEASURED FROM PIN 8 OF V7.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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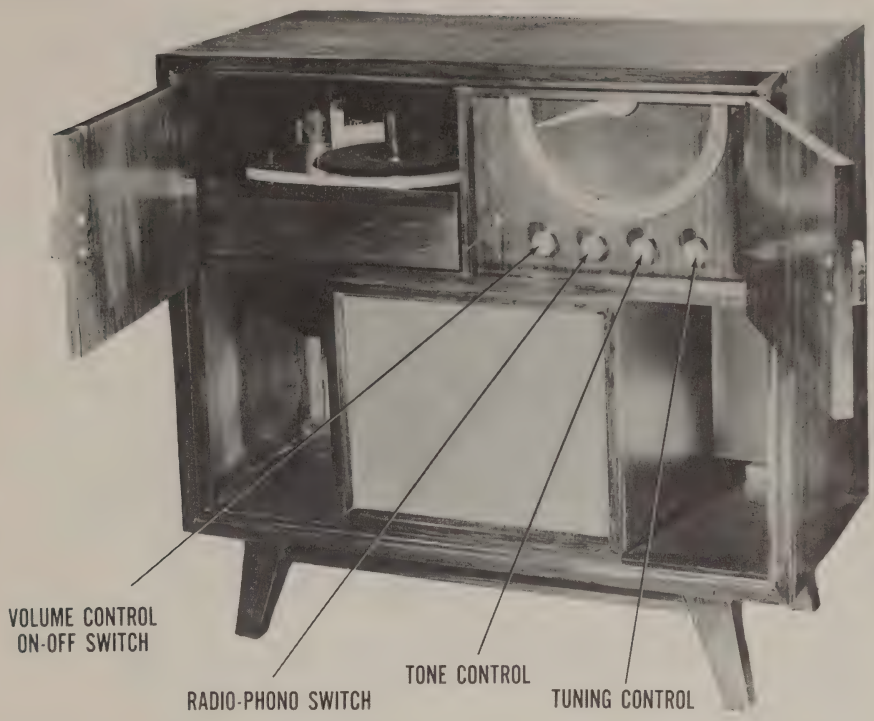
1. DC Voltage measurements are at 20,000 ohms per volt: AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

MOTOROLA
MODELS 7F11, 7F11B (Ch. HS-265)



MOTOROLA
MODELS 7F11, 7F11B (Ch. HS-265)

MOTOROLA MODEL 7F11

TRADE NAME	Motorola, Models 7F11, 7F11B (Ch. HS-265)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago, Illinois
TYPE SET	AC Operated Combination Phono-Radio Superheterodyne Receiver with Loop Antenna
TUBES (SEVEN)	Types 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AV6 DET-AVC-AF, (2) 6V6GT Power Output, 7Z4 Rectifier
POWER SUPPLY	110-120 Volts AC — RATING .60 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed. Loosen the pointer adjust screw.(DO NOT REMOVE THE NUT FROM FRONT OF POINTER.), and set pointer in its horizontal position at low frequency end of dial. Tighten the adjustment screw.

Turn RADIO-PHONO switch to "RADIO" position (counter-clockwise).

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 6BE6 (V2). Low side to chassis.	455KC (400 ∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	.1MFD	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Tune for max. output	"	A6, A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

RECORD CHANGER -- MOTOROLA MODEL RC-37

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 7F11

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amp.	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amp.	6BA6	6BA6	7BK	
V4	DET.-AVC-AF	6AV6	6AV6	7BT	
V5	Power Output	6V6GT	6V6GT	7AC	
V6	Power Output	6V6GT	6V6GT	7AC	
V7	Rectifier	7Z4	7Z4	5AB	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	300	23B690975	AFH888G4D		UPT44435C4		TVL-4605	▪ Filter
B	40	250		PRS25/25				TVA-1205	■ Filter
C	40	250							▲ Filter
D	40	25							Output Cathode
C2	270		21K400037	SI270	D6-271	5W5T25	GP2K-270	19C31	RF Coupling
C3	.05	400	8R9816	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C4	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	RF Amp. Screen
C5	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	Fixed Trimmer
C6	24		21R28816	SI25	D6-250	5W5Q25	GP1K-25	19C27	Osc. Grid Cap.
C7	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	Conv. Decoupling
C8	10000		21K482726	BPD-01	DD-103	PTE4S1	811-01	36C1	IF Amp. Dec.
C9	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	Diode RF Filter
C10	100		21B77286	SI100	D6-101	5W5T1	GP1K-100	19C11	Diode RF Filter
C11	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C12	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C13	270		21K400037	SI270	D6-271	5W5T25	GP2K-270	19C31	AF Amp. Plate
C14	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C15	.005	600	8R9813	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C16	.05	400	8R9816	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C17	.05	400	8R9816	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C18	.002	400	8R9824	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate
C19	.002	400	8R9824	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate
C20	.05	400	8R490232	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

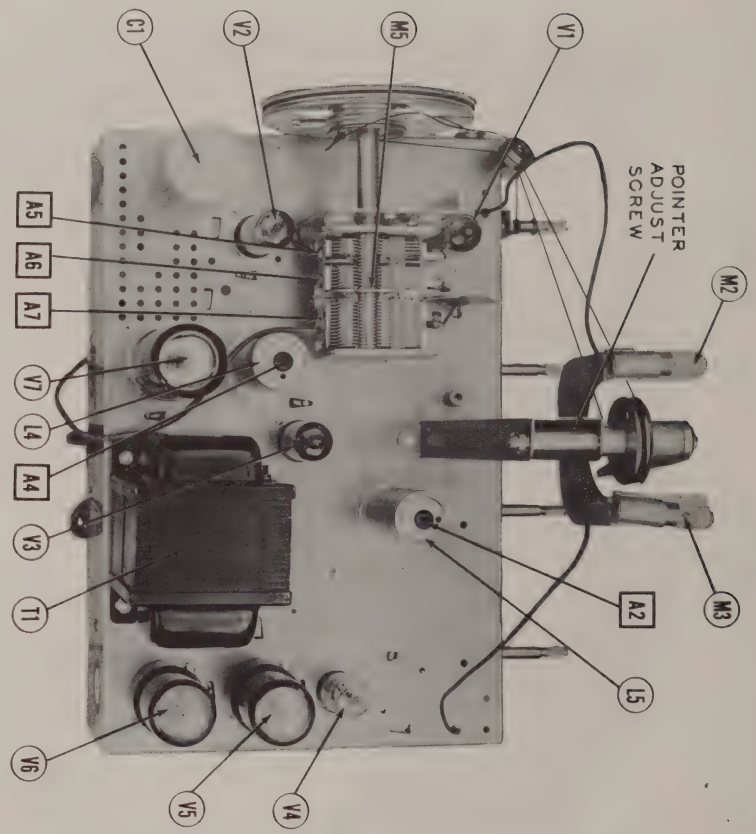
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	2 Meg.	½	18A600974	QI3-139X	AT-115	ANT-80	Volume control-tapped at 600KΩ
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SW-A	K-155	Attach to R1A per instructions
R2A	1 Meg.	½	18K77399	QI4-137	AM-61-S	AN-68	Tone control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R3	1 Meg.	½	6R6004	BTS-1 Meg.	RF Grid
R4	330Ω	½	6R5551	BTS-330	RF Cathode-See Note 1
R5	47KΩ	½	6R6056	BTS-47K	RF Screen
R6	470Ω	½	6R3949	BTS-470	Parasitic Supp.
R7	47KΩ	½	6R6056	BTS-47K	Osc. Grid
R8	1500Ω	½	6R6038	BTS-1500	Parasitic Supp.
R9	3.3 Meg.	½	6R6497	BTS-3.3 Meg.	AVC Network
R10	12KΩ	2	6R5766	BTB-12K	Conv. Decoupling-See Note 2
R11	220Ω	½	6R6270	BTS-220	IF Cathode
R12	12KΩ	2	6R5766	BTB-12K	IF Decoupling-See Note 2
R13	1 Meg.	½	6R6004	BTS-1 Meg.	Diode Load
R14	47KΩ	½	6R6056	BTS-47K	Diode Filter
R15	10 Meg.	½	6R2109	BTS-10 Meg.	AF Grid
R16	33KΩ	½	6R6410	BTS-33K	Tone Comp.
R17	470KΩ	½	6R6032	BTS-470K	Output Grid
R18	68KΩ	½	6R6001	BTS-68K	AF Plate

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R19	470KΩ	½	6R6032	BTS-470K	Output Grid
R20	220Ω	½	6R6389	BTS-220	Output Cathode
R21	390Ω	1	6R5598	BTA-390	Output Plate Load
R22A	180Ω	3	17A690973		Filter-Wire Wound
B	180Ω				Filter-Wire Wound

Note 1. Some models use a 120Ω resistor in this application.
Note 2. Some models use two 5600Ω, 1 watt resistors in series to obtain required resistance and wattage.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ .60A	500VCT .090ADC	7VAC Tap @ 6.3VAC @ 2.7A		25B691035			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	3000Ω per plate	3.7Ω	150Ω per plate	.5Ω	25B690898				

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	VIKING PART No.	QUAM PART No.	
	FIELD	V. C. IMP.				
SP1	PM	3.7Ω	50C601037	10J12	10A4A	
	CONE DIA.	V. C. DIA.				
SP2	9 3/8"	1"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	Loop Ant.	2.8Ω		24C690896		
L2	RF Coil	2.8Ω	5Ω	24B690899		
L3	Osc. Coil	14.1Ω		24B690976		
L4	1st IF	14Ω	14Ω	24B482863		
L5	2nd IF	14Ω	14Ω	24B482865		

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA					REMARKS
	MOTOROLA PART No.	ASTATIC PART No.		SHURE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		AC-AG-J	A-AG	W26B	A66U	

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

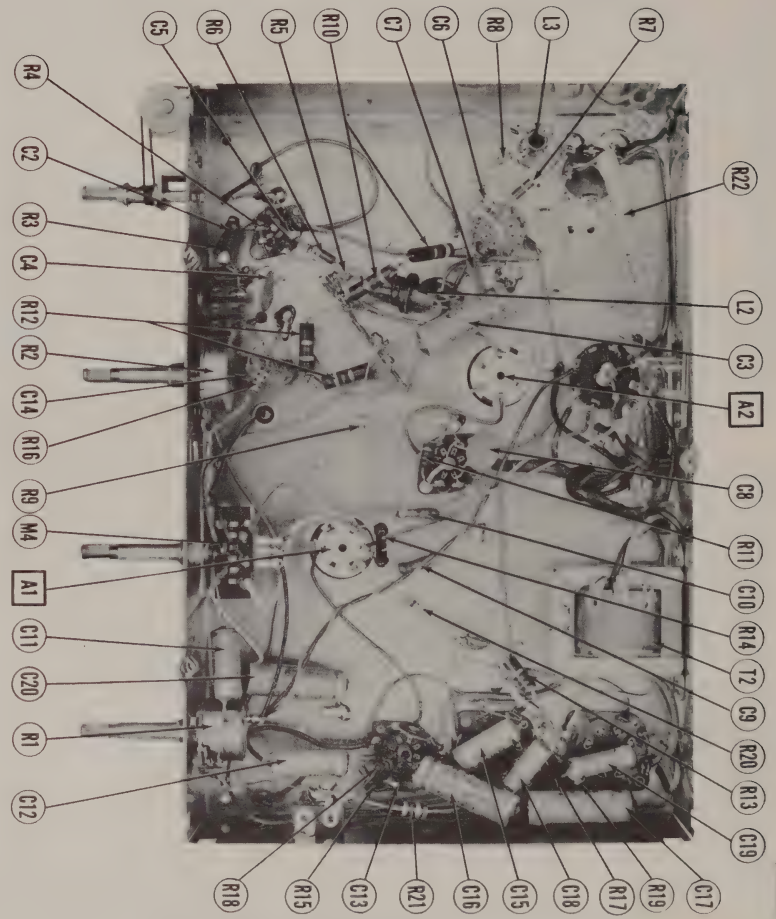
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M2	Bayonet	6-8	.25	Blue	65X10867		Type #44
M3	Bayonet	6-8	.25	Blue	65X10867		Type #44

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Switch	40B601065	Radio-Phono
M5	3 Gang Var. Cap.	19B690978	(21-454MMF, 25-234MMF, 13-186MMF)
	Cabinet	16F600641	Model 7F11
	Cabinet	16K600642	Model 7F11B
	Dial Scale	34K601066	
	Dial Pointer	1X600851	

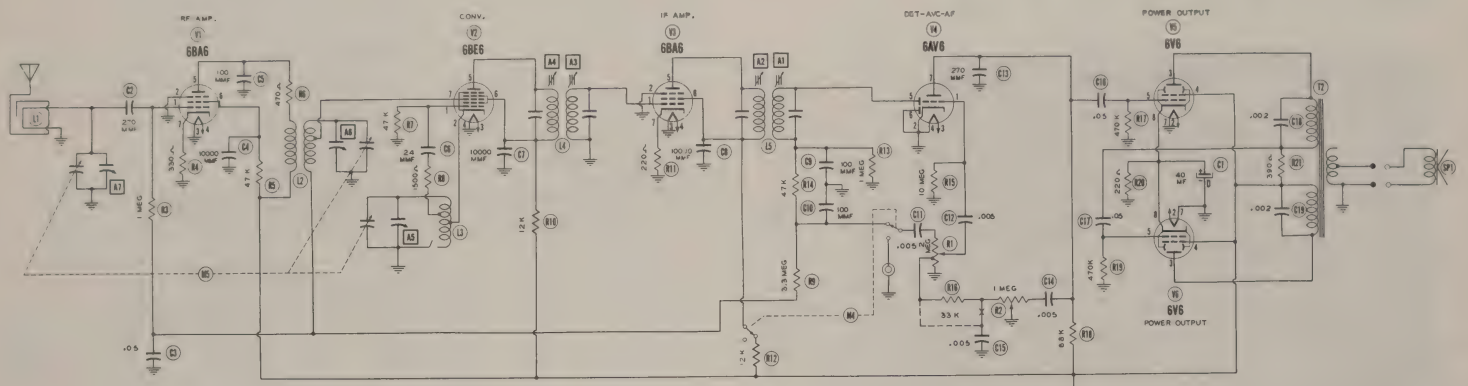
CHASSIS—BOTTOM VIEW



SET113
FOLDER 5

MOTOROLA MODEL 7F11

MOTOROLA MODEL 7F11



RADIO - PHONO SWITCH IN "RADIO" POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	-.3VDC	0V.	0V.	6.3VAC	215VDC	150VDC	2.6VDC	
V 2	6BE6	5-6.6VDC	0V.	6.3VAC	0V.	100VDC	100VDC	-.4VDC	
V 3	6BA6	0V.	0V.	0V.	6.3VAC	105VDC	105VDC	2.4VDC	
V 4	6AV6	-.7VDC	0V.	6.3VAC	0V.	-.8VDC	0V.	165VDC	
V 5	6V6GT	0V.	6.3VAC	305VDC	330VDC	0V.	315VDC	0V.	14VDC
V 6	6V6GT	0V.	6.3VAC	315VDC	330VDC	0V.	0V.	0V.	14VDC
V 7	7Z4	0V.	0V.	250VAC	0V.	0V.	250VAC	250VDC	7.2VAC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BA6	5.3 Meg.	0Ω	0Ω	.1Ω	†830Ω	†48KΩ	230Ω	
V 2	6BE6	47KΩ	.1Ω	.1Ω	0Ω	†13KΩ	†13KΩ	4.3 Meg.	
V 3	6BA6	1MΩ	0Ω	0Ω	.1Ω	†13KΩ	†13KΩ	230Ω	
V 4	6AV6	10 Meg.	0Ω	.1Ω	0Ω	1 Meg	0Ω	†69KΩ	
V 5	6V6GT	0Ω	.1Ω	†900Ω	†360Ω	470KΩ	†510Ω	0Ω	230Ω
V 6	6V6GT	Inf.	.1Ω	†510Ω	†360Ω	470KΩ	Inf.	0Ω	230Ω
V 7	7Z4	0Ω	Inf.	85Ω	Inf.	Inf.	85Ω	110KΩ	.1Ω

† MEASURED FROM PIN 7 OF V7.

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

OPERADIO
MODEL 11A55

OPERADIO
MODEL 11A55

OPERADIO MODEL 11A55

TRADE NAME	Operadio, Model 11A55 (Ch. 1A265 Recorder, 1A270 Power Amplifier)
MANUFACTURER	Operadio Manufactoring Co. St. Charles, Illinois
TYPE SET	AC Operated Tape Recorder
TUBES(FIVE)	Types 6J7 Pre Amp., 12AX7 AF Amplifier, 6C4 Oscillator (2) 50L6GT Power Output,
POWER SUPPLY	110-120 Volts AC RATING .57 Amp. at 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		OPERADIO PART No.	STANDARD REPLACEMENT		
V1	Pre.-Amp.	262-6J7	6J7	7R	
V2	AF Amp.	262-12AV7	12AV7	9A	
V3	Oscillator	262-6C4	6C4	6BG	
V4	Power Output	262-50L6	50L6GT	7AC	
V5	Power Output	252-50L6	50L6GT	7AC	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	OPERADIO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	40	250	199-2025-406	AF8F		UP4025		TVL-1519	Voltage Doubler Cap.
C2A	30	350	199-2930	AF64H		UP21145		TVL-2621	■ Filter
B	10	350		PRS350/12				TVA-1604	▲ Filter
C	10	350							Decoupling
C3	25	25	199-2001-256	PRS25/25		BT252A		TVA-1205	Pre.-Amp. Cath.
C4	40	250	199-2025-406	AF8F		UP4025		TVL-1519	Voltage Doubler Cap.
C5A	30	350	199-2930	AF64H		UP21145		TVL-2627	■ Filter
B	10	350		PRS350/12				TVA-1605	▲ Filter
C	10	350							Filter
C6	.05	400	199-4021-503	P488-05	DF-503	PTE4S5		4TM-S5	Pre-Amp. Screen
C7	.005	600	199-4030-502	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C8	.05	400	199-4021-503	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C9	.01	400	199-4020-103	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C10	500	500	199-3001-501	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	2nd AF Amp. Grid
C11	.05	400	199-4021-503	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C12	.03	400	199-4021-303	P488-03		PTE6S3		6TM-S3	Tone Comp.
C13	.05	400	199-4021-503	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C14	250	500	199-3001-251	1468-00025	D6-251	5W5T25	GP2K-250	1FM-325	Tone Comp.
C15	500	500	199-3001-501	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	Voltage Divider
C16	.003	600	199-4030-302	P688-003	D6-302	PTE6D3	GP2M-003	6TM-D3	Osc. Grid Cap.
C17	3000	500	199-3023-302	1467-003	D6-302	1W5D3	GP2M-003	1FM-23	Fixed Trimmer
C18	500	500	199-3001-501	1468-0005	D6-501	5W5T5	GP2K-500	1FM-35	Osc. Coupling
C19	.1	200	199-4011-104	P288-1	DF-104	PTE4P1		2TM-P1	Bias Filter
C20	.05	400	199-4021-503	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter

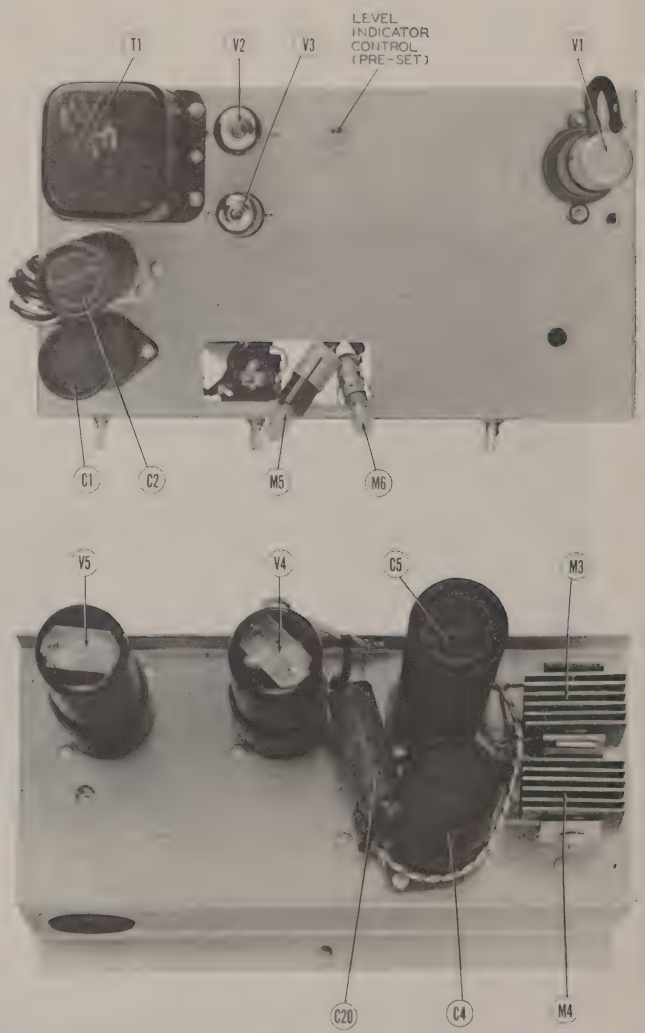
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	OPERADIO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	601-41	Q13-133	AG-60-Z	BSK-60-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions
R2A	500KΩ	½	601-40	Q13-133	AG-60-Z	BSK-60-	Tone control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R2A per instructions
R3A	500KΩ	½	601-40	Q13-133	AG-60-Z	BSK-60	Level indicator control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R3A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	OPERADIO PART No.	IRC PART No.	
R4	1 Meg.	½	600-0116-105	BTS-1 Meg.	Pre Amp. Grid
R5	2700Ω	½	600-0116-272	BTS-2700	Pre Amp. Cathode
R6	2.2 Meg	1	600-0116-225	BTA-2.2 Meg.	Pre Amp. Screen
R7	330KΩ	1	600-0116-334	BTA-330K	Pre Amp. Plate
R8	56KΩ	1	600-0116-563	BTA-56K	Tone Compensation
R9	2700Ω	½	600-0116-272	BTS-2700	AF Amp. Cathode

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA OPERADIO PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
	RESISTANCE	WATTS			
R10	330KΩ	1	600-0116-334	BTA-330K	Voltage Divider
R11	220KΩ	1	600-0116-224	BTS-220K	AF Amp. Plate
R12	1 Meg.	½	600-0116-105	BTS-1 Meg.	AF Amp. Grid
R13	47KΩ	1	600-0116-473	BTA-47K	Decoupling
R14	1500Ω	½	600-0116-152	BTS-1500	AF Amp. Cathode
R15	100KΩ	½	600-0116-104	BTS-100K	AF Amp. Plate
R16	270KΩ	½	600-0116-274	BTS-270K	Tone Compensation
R17	33KΩ	½	600-0116-333	BTS-33K	Tone Compensation
R18	1 Meg.	½	600-0116-105	BTS-1 Meg.	Series Neon
R19	27KΩ	½	600-0116-273	BTS-27K	Series Neon
R20	470KΩ	1	600-0116-474	BTA-470K	Voltage Divider
R21	6800Ω	½	600-0116-682	BTS-6800	Osc. Grid
R22	1000Ω	1	600-0116-102	BTA-1000	Filter
R23	12KΩ	1	600-0116-123	BTA-12K	Voltage Divider
R24	220KΩ	½	600-0116-224	BTS-220K	Voltage Divider
R25	33KΩ	½	600-0116-333	BTS-33K	Driver Transformer Shunt
R26	33KΩ	½	600-0116-333	BTS-33K	Driver Transformer Shunt
R27	75Ω	1	600-0116-750	BW-1-82	Output Cathode
R28	15KΩ	½	600-0116-153	BTS-15K	Filter
R29	6800Ω	2	600-0116-682	BTD-6800	Filter
R30	350Ω	5	600-1008-351	1 3/4A-350	Filter-Wire Wound
R31	50Ω	5	600-1008-500		Surge Limiter-Wire Wound
R32	56Ω	1	600-0116-560	BW-1-56	Filament Dropping
R33	56Ω	1	600-0116-560	BW-1-56	Filament Dropping
R34	56Ω	1	600-0116-560	BW-1-56	Filament Dropping

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA OPERADIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
	PRI.	SEC. 1	SEC. 2	SEC. 3				
T1	117VAC Ⓐ .100A	117VAC Ⓐ .010 ADC	6.3VCT Ⓐ .7A		710-4064		P-3045 ①	

① Drill new mounting holes.

TRANSFORMER (DRIVER)

ITEM No.	RATING				REPLACEMENT DATA OPERADIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
	IMPEDANCE		DC RES.						
	PRI.	SEC.	PRI.	SEC.					
T2			1800Ω	2600Ω CT	710-1009				

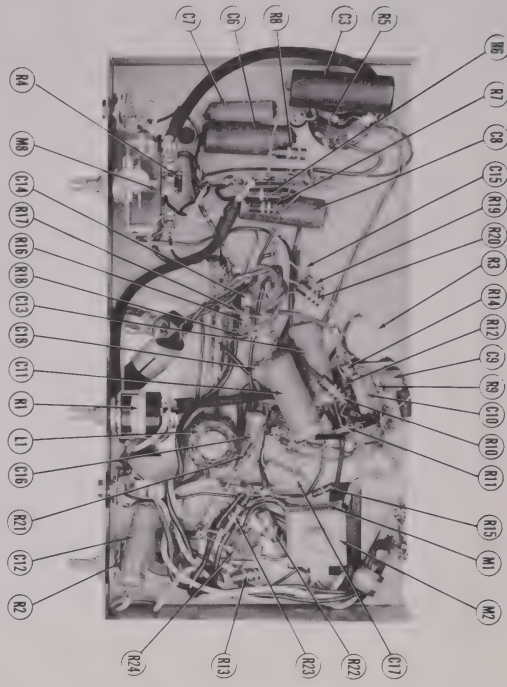
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA OPERADIO PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
	IMPEDANCE		DC RES.						
	PRI.	SEC.	PRI.	SEC.					
T3	6000Ω CT	3.8Ω	310Ω CT	7Ω	710-2033	A-3850	A-2901	RO-302	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA OPERADIO PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	V. C. IMP.				
SP1	PM	3.8Ω	S-10892	ST-8H MOD. F59-T	69A2	
	CONE DIA.	V. C. DIA.				
SP2	6" x 9"	1"				

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA OPERADIO PART No.	MEISSNER PART No.
		PRI.	SEC.		
L1	Osc. Coil	35Ω	9.2Ω	535-4	

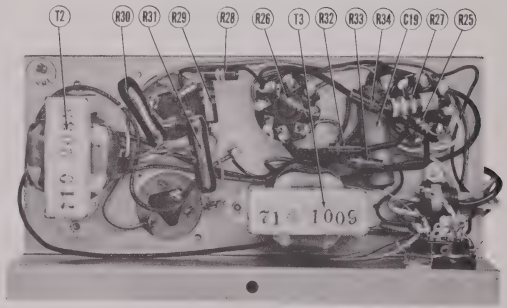
SELENIUM RECTIFIER

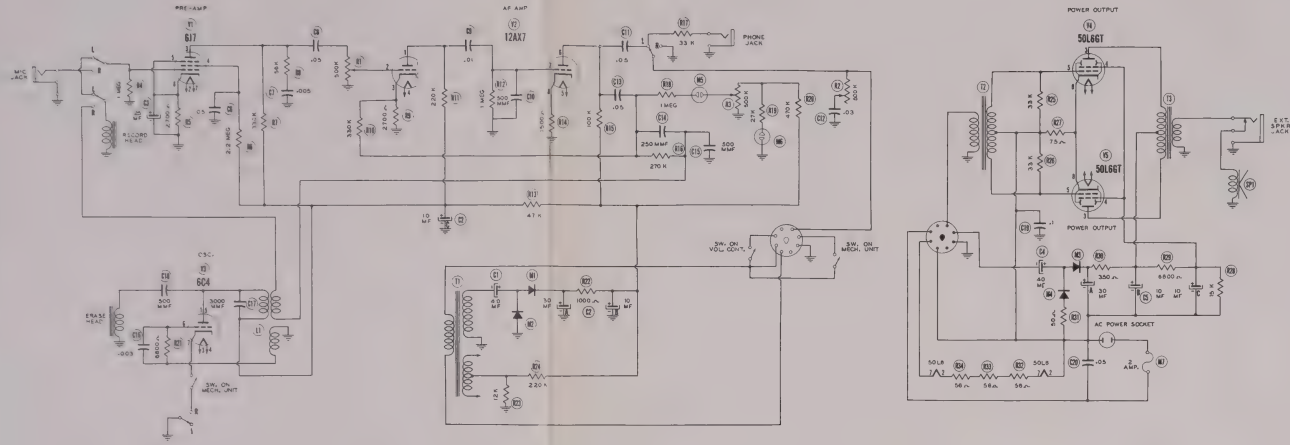
ITEM No.	RATING CURRENT	REPLACEMENT DATA OPERADIO PART No.	SYLVANIA PART No.	SELETRON PART No.	NOTES
M1	.010ADC	595-5	NB-5	8Y1	
M2	.010ADC	595-5	NB-5	8Y1	
M3	.105ADC	595-4	ND-5	5P1	
M4	.105ADC	595-4	ND-5	5P1	

MISCELLANEOUS

ITEM No.	PART NAME	OPERADIO PART No.	NOTES
M5	Neon Bulb	456-14	Type NE51
M6	Neon Bulb	456-14	Type NE51
M7	Fuse	320-835-0200	2 Amp., Type 3AG
M8	Switch	680-78	Record-Play

CHASSIS—BOTTOM VIEW





SWITCH IN "PLAY" POSITION UNLESS OTHERWISE NOTED

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9 TOP CAP
V-1	6J7	0V	+29VAC	115VDC	255VDC	1.3VDC	0V	-69VAC	1.3VDC	0V
V-2	12AX7	155VDC	0V	1.3VDC	+29VAC	+55VAC	135VDC	0V	1.3VDC	-69VAC
V-3	6C4	280VDC	265VDC	+29VAC	+29VAC	309VDC	0 -13VDC	0V		
V-4	50L6GT	0V	76VAC	115VDC	115VDC	0V	307AC	117VAC	9.3VDC	
V-5	50L6GT	0V	0V	117VDC	115VDC	0V	557AC	0 VDC	2.2VDC	

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Top Cap
V-1	6J7	501	± 1Ω	1380KΩ	13.2 Meg.	2.1KΩ	Inf.	± 1Ω	2.1KΩ	170Ω ±10%
V-2	12AX7	1270KΩ	501	2.1KΩ	± 1Ω	± 1Ω	1100KΩ	1.Meg.	1.1KΩ	PIN 9 ± 1Ω
V-3	6C4	31.1KΩ	1250Ω	± 1Ω	± 1Ω	31.1KΩ	6.8KΩ	±10%		
V-4	50L6GT	±1Ω	±100Ω	150Ω	98.1KΩ	±1.88Ω	±100Ω	±15Ω		
V-5	50L6GT	±1Ω	±1Ω	150Ω	98.1KΩ	±1.1KΩ	±100Ω	±15Ω	±15Ω	

* SWITCH IN "RECORD" POSITION.
† MEASURED FROM OUTPUT OF M1.
‡ MEASURED FROM OUTPUT OF M2.
** MEASURED FROM JUNCTION OF R23 and R24.
†† MEASURED FROM JUNCTION OF R28 and C5.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PHOTOFACT* Folder

RCA VICTOR MODELS
6T54, 6T64, 6T65, 6T71, 6T74,
6T75, 6T76 (CH. KCS47, A)

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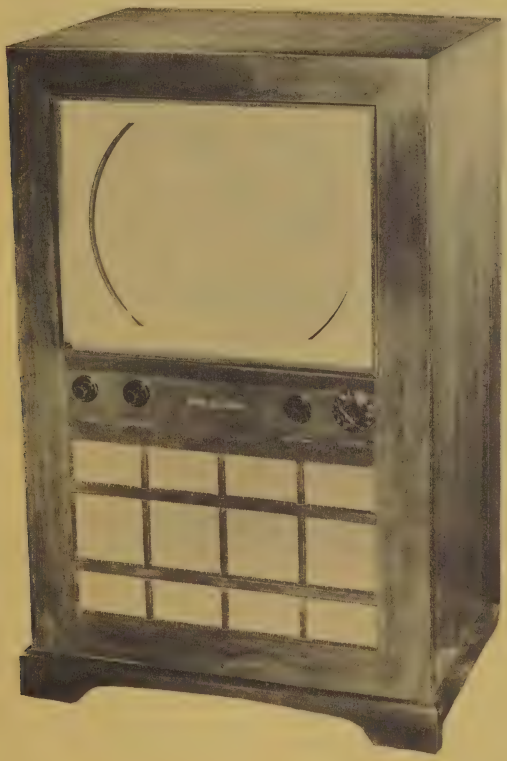

MODEL 6T64

RCA VICTOR MODELS
6T54, 6T64, 6T65, 6T71, 6T74,
6T75, 6T76 (CH. KCS47, A)

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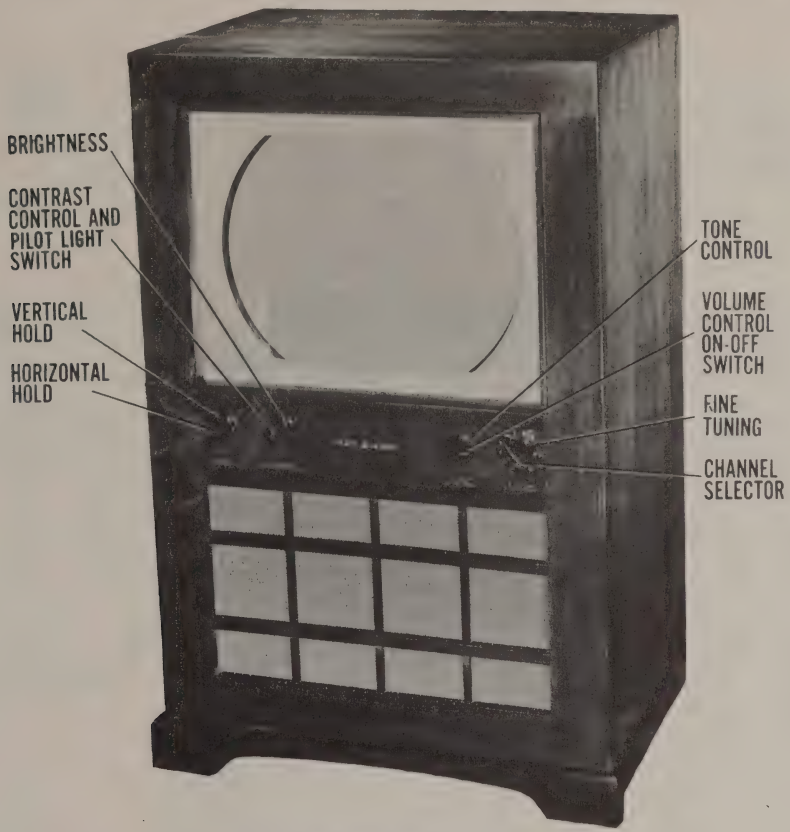

RCA VICTOR MODEL 6T64

TRADE NAME	RCA Victor Models, 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76 (Ch. KCS47,A)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, New Jersey
TYPE SET	Television Receiver
TUBES	Twenty Two
POWER SUPPLY	110-120 Volts AC
RATING	1.8 Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	

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RCA VICTOR MODELS 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76 (Ch. KCS47, A)

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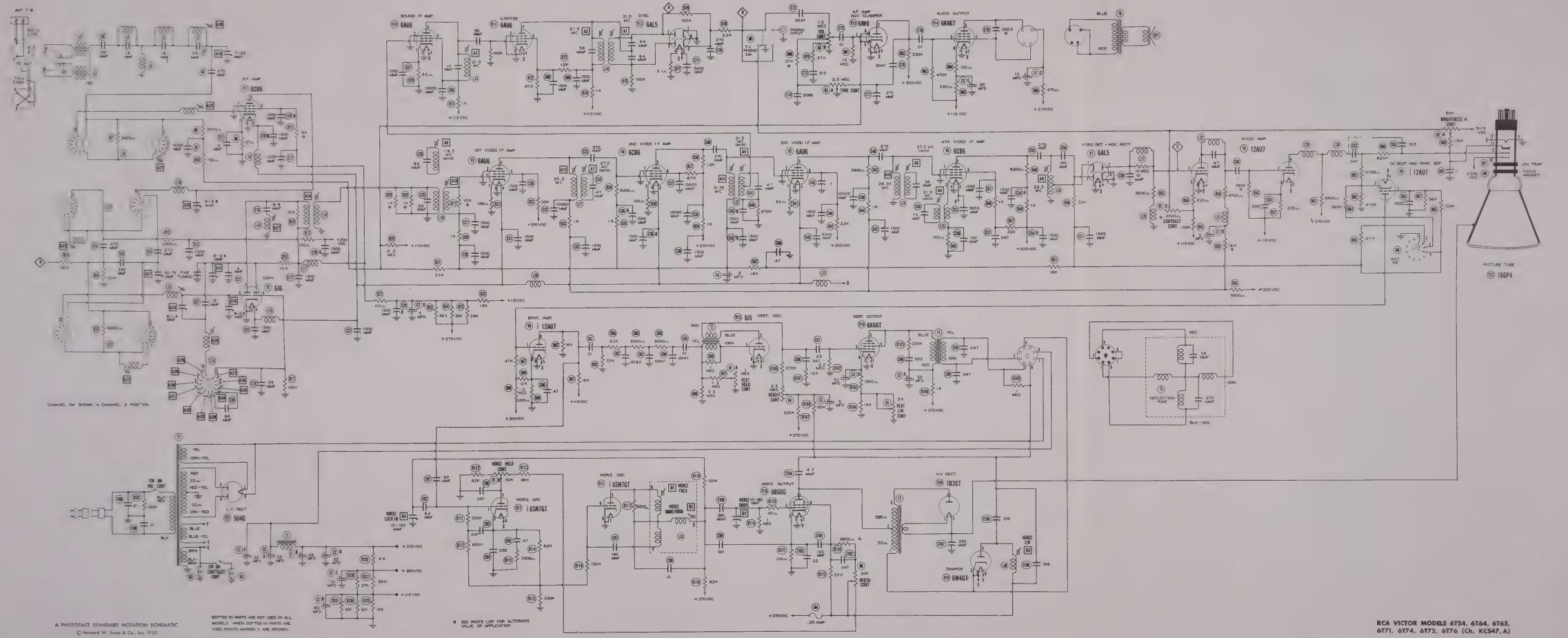

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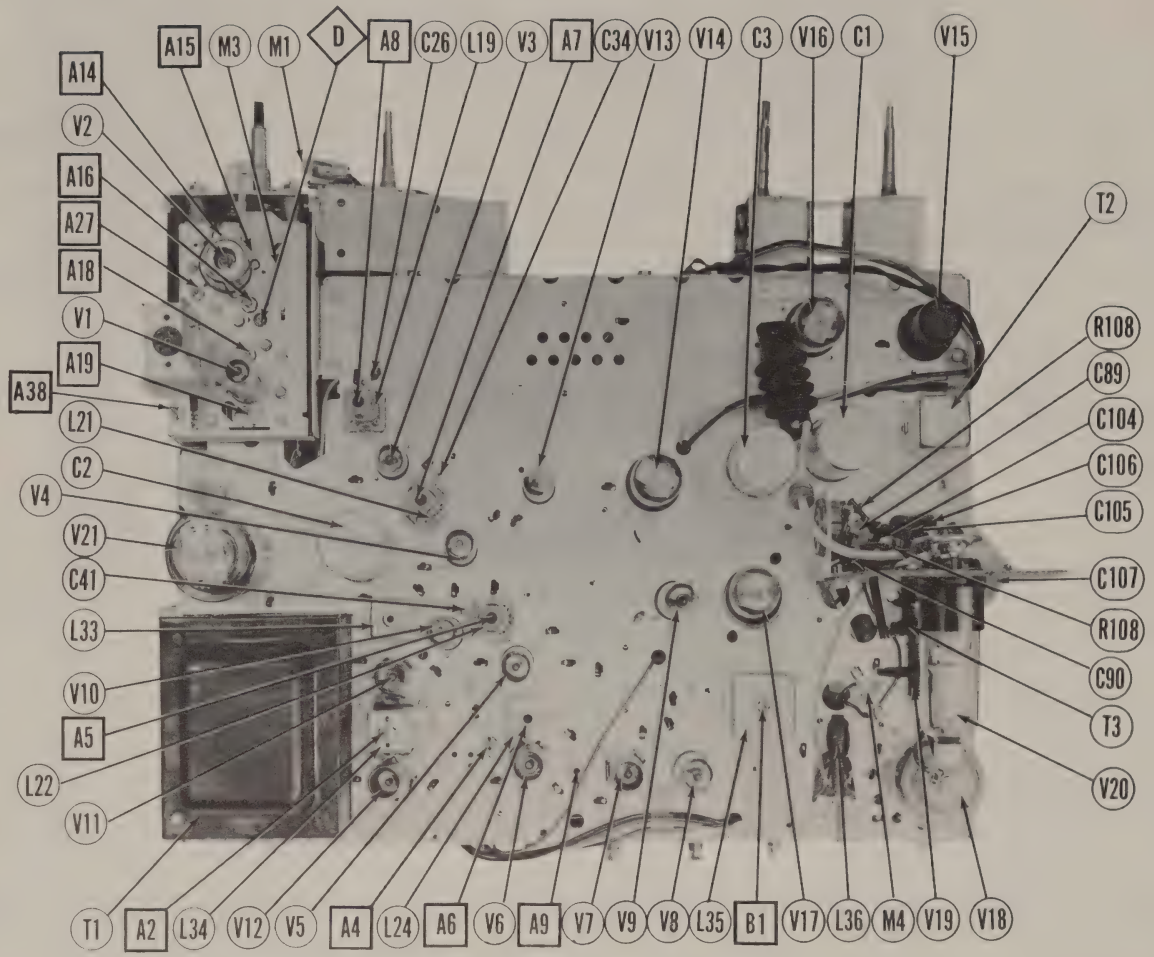
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN

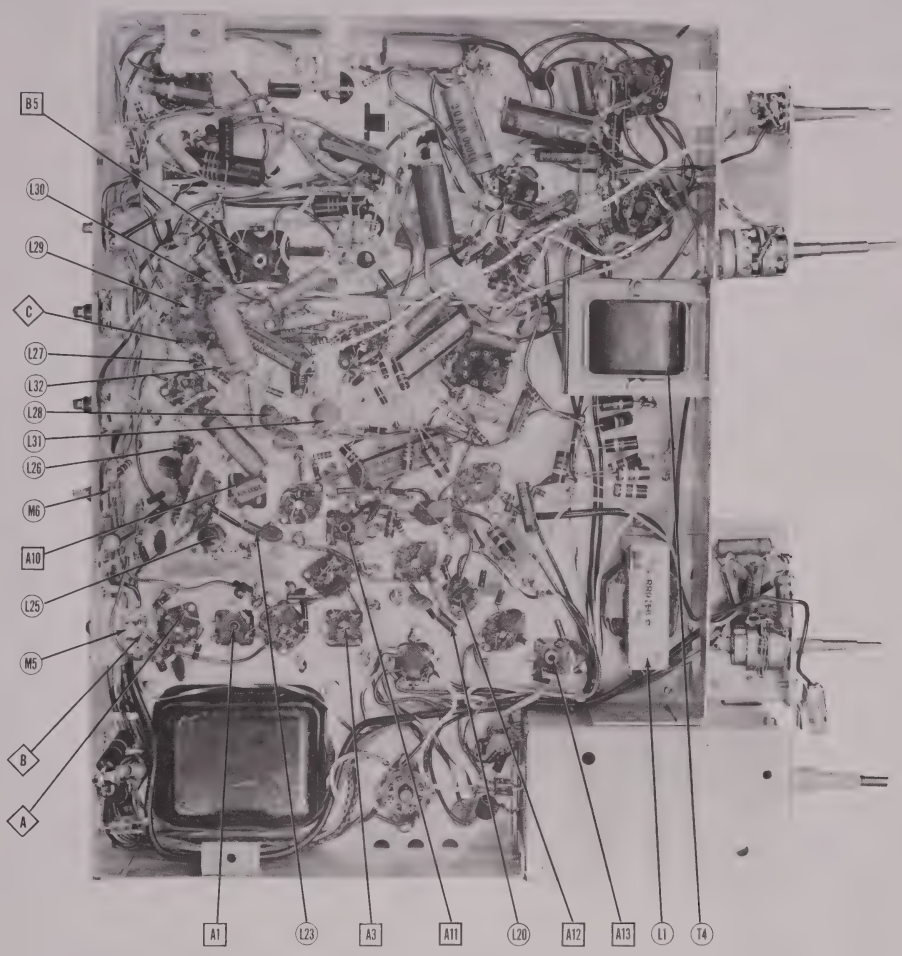
B SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RCA VICTOR MODELS 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76 (Ch. KCS47, A)

RCA VICTOR MODELS 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76 (Ch. KCS47, A)

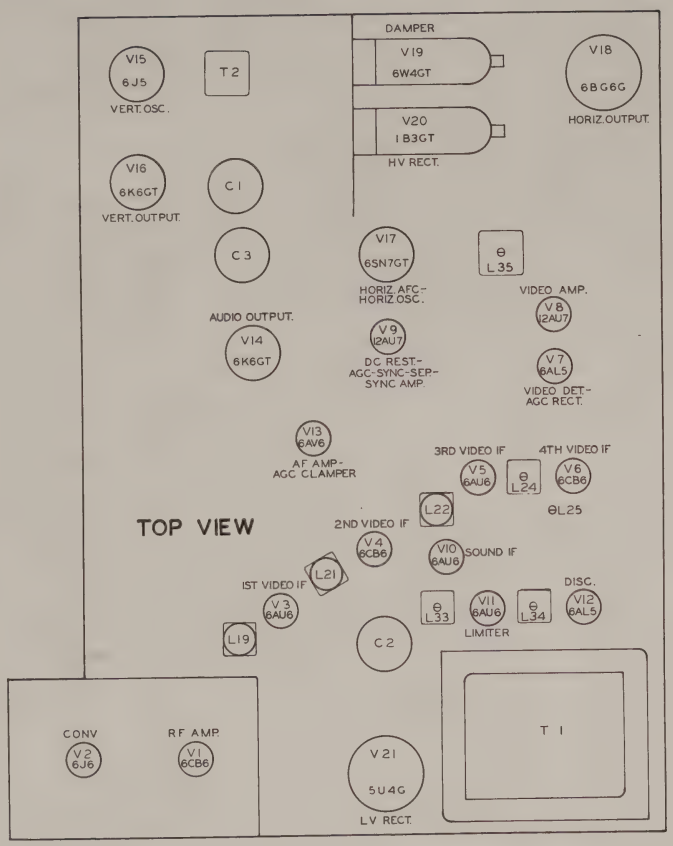


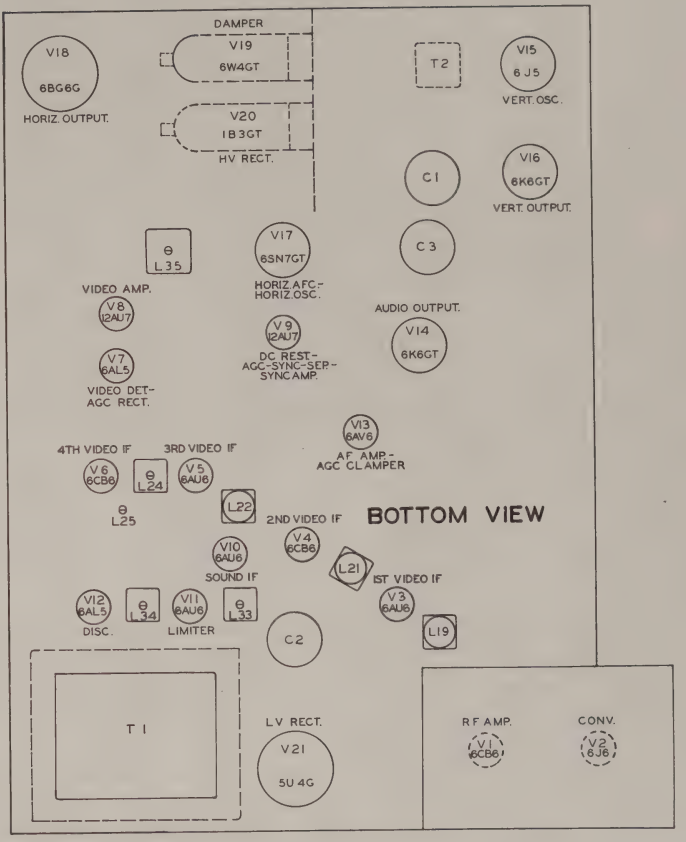
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

RCA VICTOR MODELS 6154, 6164, 6165,
6171, 6174, 6175, 6176 (Ch. KCS47,A)





TUBE PLACEMENT CHART

RCA VICTOR MODELS 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76 (Ch. KCS47,A)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To prevent the high voltage shock hazard remove the horizontal output tube (V18) from its socket.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to pin 1 (Grid) of 6AU6 (V11). Low side to chassis.	21MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1, A2	Detune A1. Adjust A2 for maximum deflection.
2.	Direct	"	"	"	DC Probe to Point (B). Common to chassis.	A1	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	Direct	High side to pin 1 (Grid) of 6AU6 (V10). Low side to chassis.	"	"	DC Probe thru 100KΩ to pin 1 (Grid) of 6AU6 (V11). Common to chassis.	A3	Adjust for maximum deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to pin 1 (Grid) of 6AU6 (V10). Low side to chassis.	21MC (450KC SWP)	21MC	Any	Vert. Amp. thru 100KΩ to pin 1 (Grid) of 6AU6 (V11). Low side to chassis.	A3	Adjust for maximum amplitude and symmetry as per figure 1.
2.	Direct	"	"	"	"	Vert. Amp. to Point (B). Low side to chassis.	A1, A2	Adjust A1 to place 21MC at center of diagonal line as per figure 2. Adjust A2 for maximum amplitude and straightness of diagonal line. Continue with step 4.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 with pin 1 removed to prevent erroneous indications.
In steps 4 thru 10 connect the negative terminal of a 3 volt battery to the junction of R21 and R30. Connect the positive terminal to chassis.
In step 11 reduce the 3 volts bias to 1 volt.
In step 12 connect a 4.5 volt battery as in steps 4 thru 10.
Before attempting step 11 connect 330Ω resistors across R34, R38, R43, and R48.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	Not used	21MC (Unmod.)	Any	Use VTVM. DC Probe to Point (C). Common to chassis.	A4, A5	Adjust for MINIMUM deflection.
5.	Direct	"	"	27MC	"	"	A6, A7	"
6.	Direct	"	"	19.5MC	"	"	A8	"
7.	Direct	"	"	22.5MC	"	"	A9	Adjust for maximum deflection.
8.	Direct	"	"	24.35MC	"	"	A10	"
9.	Direct	"	"	21.75MC	"	"	A11	"
10.	Direct	"	"	25.3MC	"	"	A12	"
11.	Direct	"	23.5MC (10MC SWP)	22.3MC 25.4MC	"	Vert. Amp. to Point (C). Low side to chassis.	A13, A14	Adjust for response curve similar to figure 3 with markers as shown. Remove the 330Ω resistors.
12.	Direct	"	"	21.85MC 24.75MC 25.5MC 26.25MC	"	"		Check for response curve similar to figure 4 with markers as shown. If necessary, slightly retouch A9 thru A14 for proper response.

RF TUNER ALIGNMENT

Remove the dummy converter tube and replace original 6J6 in its socket.
Disconnect the co-ax link from terminal 2 of the terminal board on the RF tuner and connect a 39Ω carbon resistor between terminals 1 and 2.
Loosely couple the link to the terminal board of the RF tuner.
Turn the AGC control fully counter-clockwise.
Connect the negative terminal of a 3 volt battery to terminal 3 on the terminal board of the RF tuner and the positive terminal to chassis.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE OR CONNECT VTVM	ADJUST	REMARKS
13.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	Not used	215.75MC	13	VTVM DC Probe to Point (B). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
14.	"	"	183MC (10MC SWP)	181.25MC 185.75MC	8	SCOPE Vert. Amp. to Point (D). Low side to chassis.	A16, A17, A18, A19	Adjust for shape of response curve and band width as shown in figure 5.
15.	"	"	Not used	87.75MC	6	VTVM DC Probe to Point (B). Common to chassis.	A20	Adjust as in step 13.
16.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	SCOPE Vert. Amp. to Point (D). Low side to chassis.	A21, A22, A23	Adjust for response curve similar to figure 6.
17.	Connect the VTVM to Point D and adjust A24 for -3 volts reading. If necessary, slightly retouch A21, A22, A23 and A17 for proper response on channel 6. Repeat these retouching adjustments until proper response is obtained and a -3 volts is obtained at point (D).							

FIG. 1

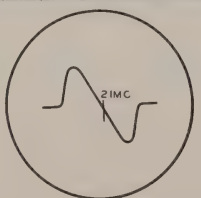


FIG. 2

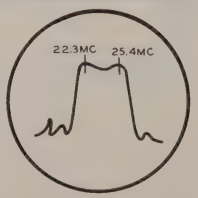


FIG. 3

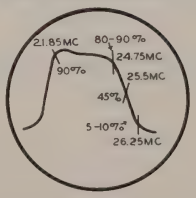


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

18.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	Not used	185.75MC	8	VTVM DC Probe to Point (B). Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
19.	"	"	183MC (10MC SWP)	181.25MC 185.75MC	8	SCOPE Vert. Amp. to Point (D). Low side to chassis.		Readjust A16, A17 and A19 for correct shape of response curve, frequency, and bandwidth as shown in figure 5. If necessary, readjust A18.
20.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"	A25	Adjust for maximum amplitude of response curve midway between the markers. Then overshoot adjustment by turning slug in same direction a little more than the turning required to reach maximum amplitude from the initial setting. Adjust A19 for maximum amplitude.
21.	"	"	Not used	215.75MC	13	VTVM DC Probe to Point (B). Low side to chassis.	A26	Adjust for zero reading as in step 18. Then overshoot adjustment as in step 20. Adjust A15 to reset oscillator to proper frequency.
22.	"	"	213MC (10MC SWP) 207MC (10MC SWP) 201MC (10MC SWP) 195MC (10MC SWP) 189MC (10MC SWP) 183MC (10MC SWP) 177MC (10MC SWP)	211.25MC 215.75MC 205.25MC 209.75MC 199.25MC 203.75MC 193.25MC 197.75MC 187.25MC 191.75MC 181.25MC 185.75MC 175.25MC 179.75MC	13 12 11 10 9 8 7	SCOPE Vert. Amp. to Point (D). Low side to chassis.		Check all high band channels for proper response with markers above 80%. If markers do not appear well within 80%, repeat step 14. If A19 is adjusted, the adjustment should be overshot a small amount and compensated for by adjusting A25 for maximum amplitude between the sound and video markers. If the valley in the top of the curves for the high channels is deeper than normal, adjust A27 to flatten the curve. In later productions A24 may be fixed and will not require adjustment.
23.	Check the oscillator frequency for the high band channels. If the oscillator is off frequency, overshoot the adjustment of A15 and compensate for by adjusting A26 for zero voltage at Point B .							
24.	Repeat step 15.							
25.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	83.25MC 87.75MC	6	SCOPE Vert. Amp. to Point (D). Low side to chassis.		Check for reponse curves similar to figure 6. If necessary, slightly readjust A21, A22 and A23 for proper response.
26.	Check the voltage at Point D. If necessary adjust A24 for a -3 volt reading. If A24 is adjusted, turn the channel switch to channel 8 and readjust A16 for proper response.							
27.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	83.25MC 87.75MC	6	SCOPE Vert. Amp. to Point (D). Low side to chassis.		Check all low band channels for proper shape of response curves as shown in figure 6 and the injection voltage at Point D which should be -3 volts. Also recheck channels 7 thru 13.
28.	"	"	Not used	215.75MC	13	VTVM DC Probe to Point (B). Common to chassis.		If necessary adjust A15 for zero reading as in step 13.
29.	"	"	"	209.75MC	12	"	A28	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
				203.75MC	11		A29	
				197.75MC	10		A30	
				191.75MC	9		A31	
				185.75MC	8		A32	
				179.75MC	7		A33	
				87.75MC	6		A20	
				81.75MC	5		A34	
				71.75MC	4		A35	
				65.75MC	3		A36	
				59.75MC	2		A37	
30.	Turn channel switch to channel 8 and adjust A14 for proper response. When A14 is properly adjusted the curve will be slightly wider with a slightly deeper valley at the top. Check all channels for proper response, oscillator injection voltage at Point (D), and oscillator frequency. Slight touch-up adjustments may be made if necessary. If A16 and A24 are changed considerably, a recheck of the oscillator frequency on all channels should be made.							
31.	Disconnect the 39Ω resistor from terminals 1 and 2 on the terminal board of the RF Tuner and reconnect the co-ax link. Repeat steps 11 and 12 of Video IF Alignment.							

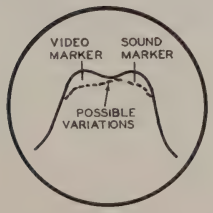


FIG.5

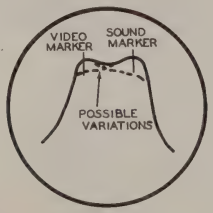
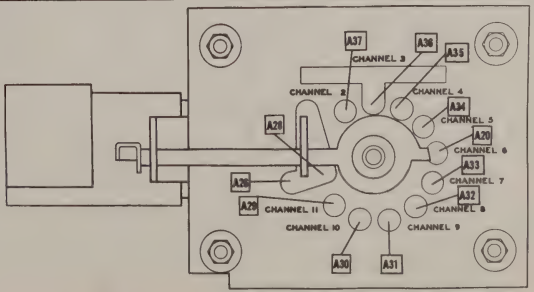


FIG.6



OSC. ALIGNMENT POINTS

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-.2VDC	.4VDC	0V.	6.3VAC	160VDC	80VDC	0V.		
V 2	6J6	55VDC	130VDC	0V.	6.3VAC	-1VDC	§-2.3VDC	0V		
V 3	6AU6	-.2VDC	0V.	0V.	6.3VAC	100VDC	120VDC	1VDC		
V 4	6CB6	-.2VDC	1VDC	6.3VAC	0V.	130VDC	105VDC	0V.		
V 5	6AU6	-.2VDC	0V.	0V.	6.3VAC	80VDC	115VDC	.8VDC		
V 6	6CB6	0V.	1.9VDC	6.3VAC	0V.	125VDC	135VDC	0V.		
V 7	6AL5	0V.	-.3VDC	0V.	6.3VAC	0V.	0V.	-.2VDC		
V 8	12AU7	100VDC	-.2VDC	6VDC	6.3VAC	6.3VAC	▲180VDC	▲0V.	▲3VDC	0V.
V 9	12AU7	5VDC	0V.	1.2VDC	6.3VAC	6.3VAC	33VDC	5VDC	6.6VDC	0V.
V 10	6AU6	-.3VDC	0V.	0V.	6.3VAC	105VDC	105VDC	.7VDC		
V 11	6AU6	-1.1VDC	0V.	0V.	6.3VAC	110VDC	75VDC	0V.		
V 12	6AL5	0V.	-.6VDC	6.3VAC	1.2VAC	0V.	0V.	-.6VDC		
V 13	6AV6	-.6VDC	0V.	6.3VAC	0V.	- .2VDC	-.2VDC	80VDC		
V 14	6K6GT	▲12VDC	6.3VAC	▲240VDC	▲250VDC	▲.2VDC	0V.	0V.	▲15VDC	
V 15	6J5	0V.	0V.	125VDC	0V.	-37VDC	0V.	6.3VAC	0V.	
V 16	6K6GT	0V.	0V.	360VDC	360VDC	0V.	0V. 36VDC	6.3VAC	32VDC 53VDC	
V 17	6SN7GT	-2 4VDC	135VDC	-2 VDC	-80VDC	205VDC	0V.	0V.	6.3VAC	
V 18	6BG6G	370VDC	6.3VAC	6.6VDC	0V.	-28VDC	0V.	0V.	310VDC 300VDC	TOP CAP *
V 19	6W4GT	0V.	0V.	500VDC	0V.	375VDC	0V.	500VDC	500VDC	
V 20	1B3GT	* DO NOT MEASURE.								
V 21	5U4G	0V.	375VDC	0V.	355VAC	0V.	355VAC	0V.	375VDC	
V 22	16GP4	0V.	.3VDC	PIN 10 370VDC	PIN 11 110VDC	PIN 12 6.3VAC				

AGC SWITCH IN POSITION 3.
TV - PHONO SWITCH IN "TV" POSITION.
▲ MEASURED FROM +115 VOLT LINE.
§ TAKEN WITH VACUUM TUBE VOLTMETER.

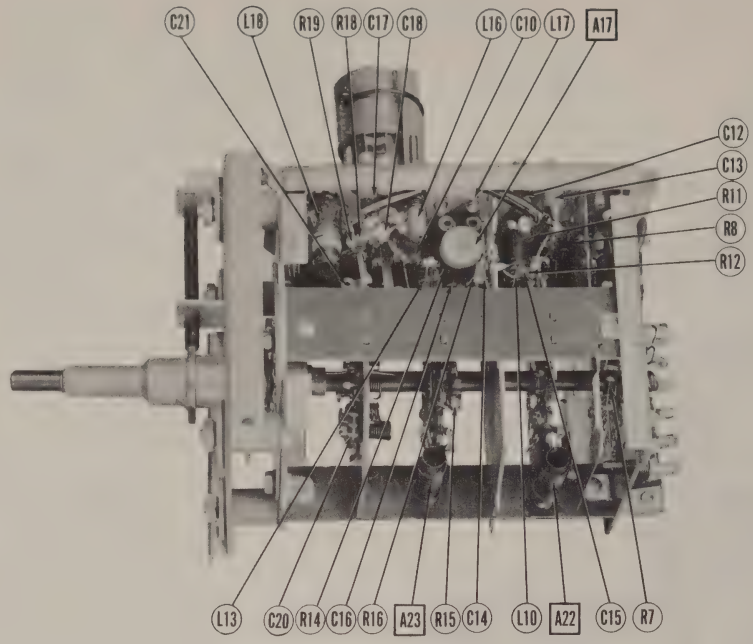
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	70KΩ	27Ω	0Ω	.1Ω	†7.4KΩ	†27KΩ	0Ω		
V 2	6J6	†19KΩ	†9KΩ	0Ω	.1Ω	100KΩ	100KΩ	0Ω		
V 3	6AU6	37KΩ	0Ω	0Ω	.1Ω	†12KΩ	†37KΩ	120Ω		
V 4	6CB6	45KΩ	120Ω	.1Ω	0Ω	†17KΩ	†50KΩ	0Ω		
V 5	6AU6	36KΩ	0Ω	0Ω	.1Ω	†15KΩ	†37KΩ	82Ω		
V 6	6CB6	.1Ω	180Ω	.1Ω	0Ω	†13KΩ	†38KΩ	0Ω		
V 7	6AL5	.1Ω	33KΩ	0Ω	.1Ω	0Ω	0Ω	5.6KΩ		
V 8	12AU7	†34KΩ	5.6KΩ	3.7KΩ	.1Ω	.1Ω	†6.8KΩ	▲560KΩ	▲220Ω	0Ω
V 9	12AU7	60KΩ	45KΩ	270KΩ	.1Ω	.1Ω	▲12KΩ	60KΩ	2.2KΩ	0Ω
V 10	6AU6	470KΩ	0Ω	0Ω	.1Ω	▲1KΩ	▲1KΩ	82Ω		
V 11	6AU6	100KΩ	0Ω	0Ω	.1Ω	▲1KΩ	▲12KΩ	0Ω		
V 12	6AL5	0Ω	100KΩ	.1Ω	3Ω	200KΩ	0Ω	100KΩ		
V 13	6AV6	10 Meg.	0Ω	.1Ω	0Ω	70KΩ	80KΩ	†140KΩ		
V 14	6K6GT	▲390Ω	.1Ω	†910Ω	†510Ω	▲470KΩ	Inf.	0Ω	▲490Ω	
V 15	6J5	0Ω	0Ω	†490KΩ †3 Meg.	Inf.	1.4 Meg.	Inf.	.1Ω	0Ω	
V 16	6K6GT	Inf.	0V.	†1.5KΩ	†1.5KΩ	2.2 Meg.	0Ω 3KΩ	.1Ω	4.7KΩ 1.5KΩ	
V 17	6SN7GT	1.5 Meg.	†50KΩ	410KΩ	480KΩ	†82KΩ	0Ω	0Ω	.1Ω	
V 18	6BG6G	†43Ω	.1Ω	100Ω	Inf.	1 Meg.	319KΩ	0Ω	†6KΩ †16KΩ	TOP CAP #22Ω
V 19	6W4GT	Inf.	Inf.	400KΩ	Inf.	†75Ω	Inf.	#0Ω	#.3Ω	
V 20	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #250Ω
V 21	5U4G	Inf.	13KΩ	Inf.	22Ω	Inf.	22Ω	Inf.	13KΩ	
V 22	16GP4	0Ω	1.2 Meg.	PIN 10 †43Ω	PIN 11 190KΩ	PIN 12 .1Ω				

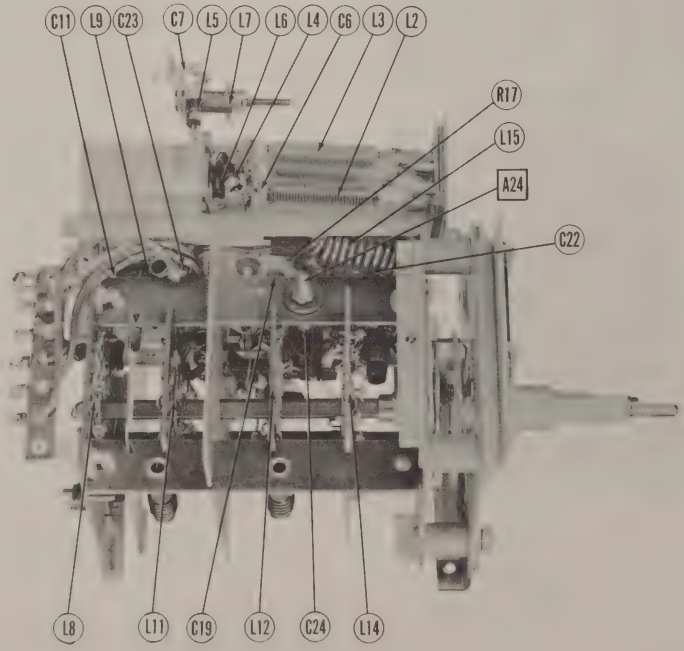
AGC SWITCH IN POSITION 3.
TV - PHONO SWITCH IN "TV" POSITION.
† MEASURED FROM PIN 8 OF V21.
▲ MEASURED FROM +115 VOLT LINE.
MEASURED FROM PIN 3 OF V19.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

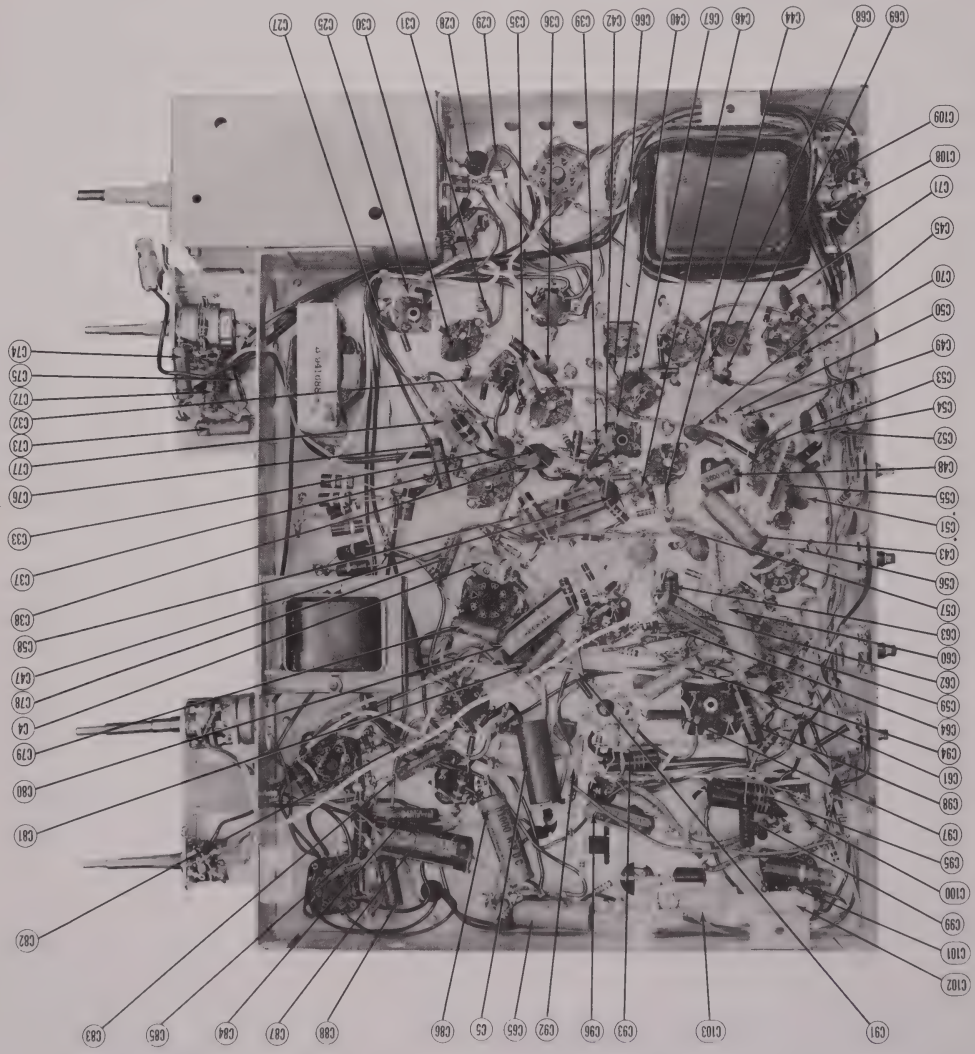


RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW–RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: RCA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6CB6	6CB6	6CK	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6CB6	6CB6	6CK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	4th Video IF	6CB6	6CB6	6CK	
V7	Video Det.-AGC Rect.	6AL5	6AL5	6BT	
V8	Video Amp.	12AU7	12AU7	9A	
V9	DC Rest.-AGC-Sync. Sep.-Sync. Amp.	12AU7	12AU7	9A	
V10	Sound IF	6AU6	6AU6	7BK	
V11	Limiter	6AU6	6AU6	7BK	
V12	Disc.	6AL5	6AL5	6BT	
V13	AF Amp.-AGC Clamp	6AV6	6AV6	7BT	
V14	Audio Output	6K6GT	6K6GT	7S	
V15	Vert. Osc.	6J5	6J5	6Q	
V16	Vert. Output	6K6GT	6K6GT	7S	
V17	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V18	Hor. Output	6BG6G	6BG6G	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rect.	1B3GT	1B3GT	3C	
V21	LV Rect.	5U4G	5U4G	5T	
V22	Picture Tube	16GP4	16GP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	35	450	75510	AFH7721J		UPT420			▬ Filter
B	35	450							■ Filter
C	10	450							▲ Output Decoup.
D	5	450							V. Amp. Decoup.
C2A	35	450	75510	AFH7721J		UPT420			▬ Filter
B	35	450							■ Filter
C	10	450							▲ Filter
D	5	450							Decoupling
C3A	20	450	75511	AFHJ164E10B		UPT421			▬ Vert. Output Dec.
B	80	200							■ Filter
C	20	200							▲ Output Cathode
D	50	50							Vert. Output Cath.
C4	2	50	73747	SRE50/2'		BBR2-50T		TVA-1301	AGC Filter
C5	5	450	28417	PRS450/4		BR445		TVA-1702	Vert. Osc. Dec.
C6	100		75437	SI100	D6-101		GP1K-100	19C11	RF Coupling
C7	39		75450		TCN-39		N750L-39		Fixed Trimmer
C8	270		75199	SI270	D6-271		GP2K-270	19C31	RF Coupling
C9	5000		73473	BPD-005	DD-502		811-005	29C1	AGC Filter
C10A	1500		75089	BPD-2 x 0015	DD-2-152		882-2 x 0015	29C6	RF Screen
B	1500								RF Filament
C11	12		75200	SI12	D6-120		GP1K-12		RF Cath.
C12	1500		75166						RF Bypass
C13	1500		75166						RF Bypass
C14	270		75199	SI270	D6-271		GP2K-270	19C31	RF Coupling
C15	270		75199	SI270	D6-271		GP2K-270	19C31	RF Coupling
C16	390		75641	SI390	D6-391		GP2K-390		RF Coupling
C17	1500		75166						Conv. Decoupling
C18	6.8		75197	SI6.8NPO	TCZ-6.8		NPOK-6.8		Fixed Trimmer
C19	39		75196		TCN-39		N750L-39		Fixed Trimmer
C20	.68		71504		TCZ-.68				Fixed Trimmer
C21	15		45465		TCZ-15		GP1K-15	19C5	Osc. Feedback
C22	4		75289				NPOK-4		Osc. Feedback
C23	1500		75166						Filament Bypass
C24	1500		73748	BPD-0015	DD-152		811-0015	29C8	Conv. Fil. Bypass
C25	56		71924		TCZ-56		NPOM-56		Fixed Trimmer
C26	82				TCZ-82		NPOM-82		Fixed Trimmer
C27	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	AGC Filter
C28	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	AGC Filter
C29A	1500		75089	BPD-2 x 0015	DD-2-152	1W5D15 / 1W5D15	882-2 x 0015	29C6	RF Bypass
B	1500								RF Bypass
C30	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	1st V. IF Screen
C31	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	1st V. IF Fil.
C32	10000		73960	BPD-01	DD-103	PTE6S1	811-01	36C1	1st V. IF Plate Dec.
C33	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	RF Bypass
C34	47				TCZ-47		NPOM-47	29C14	Fixed Trimmer
C35	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C36A	1500		75089	BPD-2 x 0015	DD-2-152	1W5D15 / 1W5D15	882-2 x 0015	29C6	AGC Filter
B	1500								2nd V. IF Fil.
C37	10000		73960	BPD-01	DD-103	PTE6S1	811-01	36C1	2nd V. IF Screen
C38	10000		73960	BPD-01	DD-103	PTE6S1	811-01	36C1	2nd V. IF Dec.
C39	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	RF Bypass
C40	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C41	47				TCZ-47		NPOM-47	29C14	Fixed Trimmer
C42A	1500		75089	BPD-2 x 0015	DD-2-152	1W5D15 / 1W5D15	882-2 x 0015	29C6	AGC Filter
B	1500								1st S. IF Grid Filter
C43	.1	400	73551	P488-1	DF-104	PTE4P1		4TM-P1	3rd V. IF Screen
C44	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	3rd V. IF Screen
C45	5000		73473	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Fil.
C46	10000		73960	BPD-01	DD-103	PTE6S1	811-01	36C1	3rd V. IF Plate Dec.
C47	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	RF Bypass
C48	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C49	75			SI75NPO	TCZ-75		NPOM-75		Fixed Trimmer
C50	100		45469	SI100NPO	TCZ-100	5W5T1	NPOM-100	36C10	4th V. IF Cath.
C51	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	4th V. IF Screen
C52	.047	400	73553	P488-047	DF-503	PTE4S5		4TM-S47	4th V. IF Screen

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C53	5000		73473	BPD-005	DD-502	1D5D5	811-005	29C1	4th V. IF Fil.
C54A	1500		75089	BPD-2 x 0015	DD-2-152	1W5D15	882-2 x 0015	29C6	4th V. IF Plate Dec.
B	1500					1W5D15			RF Bypass
C55	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C56	100		39396	SI100	D6-101	5W5T1	GP1K-100	19C11	IF Coupling
C57	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	AGC Filter
C58	.47	200	73787	P288-47		GT2P5		2TM-P47	AGC Filter
C59	10		53511	SI10	D6-100	5W5Q	GP1K-10	19C19	V. Diode Filter
C60	.1	400	73551	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C61	.0015	600	73598	P688-0015	D6-152	PTE6D2	GP2L-0015	6TM-D15	V. Amp. Cath.
C62	.047	600	73592	P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C63	.015	400	73797	P488-015		PTE6S15		6TM-S15	Video Coupling
C64	.0022	600	73595	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Sync. Sep. Grid
C65	.1	600	73557	P688-1	DF-104	PTE6P1		6TM-P1	Pic. Tube Grid
C66	10000		73960	BPD-01	DD-103	PTE6S1	811-01	36C1	1st S. IF Dec.
C67	1500		73748	BPD-0015	DD-152	1W5D15	811-0015	29C8	1st S. IF Cath.
C68	1500		75166	BPD-0015	DD-152	1W5D15	811-0015	29C8	Limiter Screen
C69	1500		75166	BPD-0015	DD-152	1W5D15	811-0015	29C8	Limiter Dec.
C70	270		75244	SI270	D6-271	5W5T25	GP2K-270	19C31	RF Bypass
C71	5000		73473	BPD-005	DD-502	1D5D5	811-005	29C1	Discr. Filament
C72	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Audio Coupling
C73	.015	200	73797	P288-015		PTE6S15		6TM-S15	Tone Comp.
C74	.0068	400	73808	P488-0068	D6-682	PTE16D7		6TM-D68	Tone Comp.
C75	.01	400	73561	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C76	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Tone Comp.
C77	270	500	39638	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Tone Comp.
C78	.01	400	73561	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C79	.0022	600	73595	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Output Plate Byp. *
C80	.47	200	73787	P288-47		GT2P5		2TM-P47	Sync. Amp. Cath.
C81	.01	400	73561	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Sync. Coupling
C82	.0022	600	73595	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Integrator Net.
C83	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Integrator Net.
C84	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Integrator Net.
C85	.01	600	73594	P688-01	D6-103	PTE6S1	811-01	6TM-S1	Vert. Sync. Coupling
C86	.047	1000	73597	P1088-047		GT16S5		MB-S5	Vert. Discharge
C87	.22	600	74957	684-25		GT6P25		6TM-P25	Vert. Sweep Coupling
C88	.022	400	73562	P488-022		PTE4S2		4TM-S22	Fixed Trimmer
C89	.047	1000	73597	P1088-047		GT16S5		MB-S5	Fixed Trimmer
C90	.047	1000	73597	P1088-047		GT16S5		MB-S5	Fixed Trimmer
C91	82	1000	73090	SI82	TCZ-82	5W5T1	GP1K-82	1FM-31	Hor. Sync. Coupling
C92	82	1000	73090	SI82					Hor. Feedback
C93	.047	400	73553	P488-047	DF-503	PTE4S5		4TM-S47	AFC Filter
C94	.022	400	73562	P488-022	DF-203	PTE4S2		4TM-S22	AFC Filter
C95	.47	200	73787	P288-47		GT2P5		2TM-P47	AFC Filter
C96	.047	600	73592	P688-047	DF-503	PTE6S5		6TM-S47	Hor. AFC Plate
C97	180	1000	73102	1469-0002	D6-181	5R5T2		MS-32	Hor. Osc. Grid
C98	.01	600	73594	P688-01		PTE6S1		6TM-S1	Fixed Trimmer
C99	.001	1000	75643	P1088-001		PTE16D1		MB-21	Hor. Discharge
C100	560	500	74250	1468-0005	D6-561	1W5T6	GP2K-560	1FM-35	Hor. Sweep Coupling
C101	100		39396	SI100	D6-101	5W5T1	GP1K-100	19C11	Hor. Output Screen
C102	.047	1000	73597	P1088-047		GT16S5		MB-S5	Hor. Output Screen
C103	.22	400	73794	P488-22		GT4P25		4TM-P22	Hor. Output Cath.
C104	4.7	5000	75646						Hor. Sweep Coupling
C105	.018	1000	74727						Damper Filter
C106	.018	1000	74727						Damper Filter
C107	250	20000	74154	HV20B	TV1-502				HV Filter
C108	.01	600	75071	P688-01	D6-103	PTE6S1	811-01	6TM-S1	Line Filter
C109	.01	600	75071	P688-01	D6-103	PTE6S1	811-01	6TM-S1	Line Filter

* Some models use .0033MFD in this application. Mfgr's Part No. 73795.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	75215	Concentrikit B11-137 *	RTV-110	SBB-510	Vert. hold control-front
B	50KΩ	½		B11-123 *			Horiz. hold control-rear
C	Shaft End			E-187 *			Attach per instr. in "Concentrikit".
R2A	50KΩ	½	75514		RTV-193		Brightness control-front / Contrast control and switch-rear — See note 1
B	3500Ω	½					
R3A	2.5 Meg.	½	75513	Concentrikit B11-139 *	RTV-194	SBT-219-S	Tone control-front
B	1.5 Meg.	½		B18-139XX *			Volume control tapped at 250K, 500K, rear
C	Shaft End			E-187 *			Attach per instr. in "Concentrikit".
D	Switch			76-1 *			Attach per instr. in "Concentrikit".
R4A	2.5 Meg.	½	71440	Q11-239	AM-84-S	AN-83	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5A	5000Ω	½	71441	Q11-114	AM-19-S	AN-10	Vert. linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	20KΩ	½	75516	Q16-119	AM-37-U	B-24	Width control
B	Shaft		Not Req.	Not Req.	FKS-1/4		Attach to R6A per instructions

* Additional parts to be used with "Concentrikit".
Note 1. Chassis KCS47 uses same control with out switch, part No. 75216.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R7	3900Ω	½		BTS-3900	RF Coil Shunt
R8	27Ω	½			RF Amp. Cathode
R9	3900Ω	½		BTS-3900	RF Amp. Grid
R10	150Ω	½		BTS-150	AGC Network
R11	18KΩ	½			RF Amp. Screen-See Note 2
R12	3300Ω	½		BTS-3300	RF Amp. Plate
R13	100Ω 20%	½		BTS-100	RF Amp. Plate Decoupling
R14	100KΩ	½			Series Test Point

RESISTO

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.
R15	8200Ω	½		
R16	100KΩ	½		
R17	100KΩ	½		
R18	10KΩ	½		
R19	10KΩ 5%	½		
R20	2.2 Meg.	½		
R21	33KΩ	½		
R22	100Ω 20%	2		BTS-100
R23	39KΩ	2		
R24	39KΩ	2		
R25	39KΩ	2		
R26	10KΩ	2		
R27	10KΩ	½		
R28	1000Ω 20%	½		BTS-1000
R29	1000Ω 20%	½		BTS-1000
R30	1000Ω 20%	½		BTS-1000
R31	120Ω	½		BTS-120
R32	33KΩ	½		
R33	1000Ω 20%	½		BTS-1000
R34	8200Ω 5%	2		
R35	1000Ω 20%	½		BTS-1000
R36	120Ω	½		BTS-120
R37	47KΩ	½		
R38	12KΩ 5%	1		
R39	1000Ω 20%	½		BTS-1000
R40	470KΩ	½		
R41	82Ω	½		BTS-82
R42	33KΩ	½		
R43	3900Ω 5%	½		BTS-3900
R44	1000Ω 20%	½		BTS-1000
R45	180Ω	½		BTS-180
R46	1000Ω 20%	½		BTS-1000
R47	33KΩ	½		
R48	8200Ω 5%	1		
R49	1000Ω 20%	½		BTS-1000
R50	33KΩ 20%	½		BTS-33K
R51	18KΩ	½		BTS-18K
R52	18KΩ	½		BTS-18K
R53	5600Ω 5%	½		BTS-560(
R54	220Ω	½		BTS-220
R55	100KΩ 5%	½		BTS-100K
R56	560KΩ	½		BTS-560K
R57	220Ω	½		BTS-220
R58	4700Ω 5%	½		BTS-470(
R59	18KΩ	1		BTA-18K
R60	6800Ω	2		BTB-680(
R61	6800Ω 5%	1		BTA-680(
R62	470KΩ	½		BTS-470K
R63	4700Ω	½		BTS-470(
R64	390KΩ	½		BTS-390K
R65	150KΩ 20%	½		BTS-150K
R66	47KΩ	½		BTS-47K
R67	56KΩ	½		BTS-56K
R68	820KΩ	½		BTS-820K
R69	150KΩ	½		BTS-150K
R70	82Ω	½		BTS-82
R71	1000Ω 20%	½		BTS-100(
R72	47KΩ	½		
R73	12KΩ	½		
R74	1000Ω 20%	½		BTS-100(
R75	100KΩ 5%	½		BTS-100K
R76	100KΩ 5%	½		BTS-100K
R77	5.1Ω	½	72067	
R78	22KΩ 20%	½		BTS-22K
R79	27KΩ	½		BTS-27K
R80	27KΩ	½		BTS-27K
R81	10 Meg. 20%	½		BTS-10 M
R82	330KΩ	½		BTS-330K
R83	470KΩ 20%	½		BTS-470K
R84	100Ω 20%	½		BTS-100
R85	390Ω	1		BTA-390
R86	470Ω	1		BTA-470
R87	47KΩ	½		BTS-47K
R88	1.2 Meg.	½		BTS-1.2
R89	12KΩ	½		BTS-12K
R90	2200Ω 20%	½		BTS-220
R91	18KΩ	1		BTA-18K
R92	18KΩ	½		BTS-18K
R93	22KΩ	½		BTS-22K
R94	22KΩ	½		BTS-22K
R95	8200Ω	½		BTS-820
R96	8200Ω	½		BTS-820
R97	1.2 Meg. 5%	½		BTS-1.2
R98	3.3 Meg. 5%	½		BTS-3.3
R99	1 Meg. 20%	½		BTS-1 M
R100	270KΩ	½		BTS-270
R101	12KΩ	½		BTS-12K
R102	2.2 Meg.	½		BTS-2.2
R103	1500Ω	1		BTA-150
R104	15KΩ	½		BTS-15K
R105	220KΩ	½		BTS-220
R106	1000Ω 20%	½		BTS-100
R107	220KΩ	½		BTS-220
R108	150KΩ	½		BTS-150
R109	1 Meg. 20%	½		BTS-1 M
R110	150KΩ	½		BTS-150
R111	330KΩ	½		BTS-330
R112	820KΩ	½		BTS-820
R113	330KΩ 5%	1		BTA-330
R114	82KΩ	1		BTA-82
R115	3900Ω	½		BTS-390
R116	150KΩ 5%	1		BTA-150
R117	8200Ω 5%	½		BTS-820
R118	82KΩ 5%	1		BTA-82
R119	1 Meg.	½		BTS-1 M

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C53	5000			73473	BPD-005	DD-502	ID5D5	81L-005	29C1	4th V. IF Ftl.
C54A	1500			75089			1WSD15			4th V. IF Plate Dec.
B	1500				BPD-2 x 0015	DD-2-153	1WSD15	882-3 x 0015	29C6	RF Bypass
C55	270	1000	73091		1468-00025	D6-371	5WS7S2	GP2K-270	1FM-335	IF Coupling
C56	100	300	39396		32100	D6-101	5WS7S	GP1K-100	19C10	IF Coupling
C57	150			73748	BPD-0015	DD-153	1WSD15	81L-0015	29C8	AGC Filter
C58	47	200	73787		P288-47		GT2P5		2TM-P47	AGC Filter
C59	10			53511	3100	D6-100	5WS6J	GP1K-10	19C9	V. Diode Filter
C60	.1	400	73551		P488-1		DF-104	PTE4P1	4TM-P1	Video Coupling
C61	.0015	600	73586		P688-0015	D6-152	PTE6D2	GP2L-0015	6TM-D15	V. Amp. Cath.
C62	.047	600	73593		P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C63	.015	400	73797		P488-015		PTE8S15		6TM-S15	Video Coupling
C64	.0022	600	73585		P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Sync. Sep. Grid
C65	1	600	73557		P688-1	DF-104	PTE6P1		6TM-P1	Pic. Tube Grid
C66	10000		73960		BPD-01	DD-103	PTE8S1	81L-01	38C1	1st S. IF Dec.
C67	1500		73748		BPD-0015	DD-152	1WSD15	81L-0015	29C8	1st S. IF Cath.
C68	1500		75166		BPD-0015	DD-152	1WSD15	81L-0015	29C8	Limiter Screen
C69	1500		75166		BPD-0015	DD-152	1WSD15	81L-0015	29C8	Limiter Dec.
C70	270		73544		3270	D6-271	5WS7S2	GP2K-270	19C31	RF Bypass
C71	5000		73473		BPD-005	DD-502	ID5D5	81L-005	29C1	Discr. Filament
C72	.0047	600	73920		P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Audio Coupling
C73	.015	300	73797		P288-Q15		PTE8S15		6TM-S15	Tone Comp.
C74	.0068	400	73800		P488-0068	D6-682	PTE6D7		6TM-D68	Tone Comp.
C75	.01	600	73561		P688-01	D6-103	PTE6S1	81L-01	6TM-S1	Audio Coupling
C76	.0047	600	73920		P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Tone Comp.
C77	220	500	39636		1468-00025	D6-271	5WS7S5	GP2K-270	1FM-325	Tone Comp.
C78	.01	400	73561		P488-01	D6-103	PTE4S1	81L-01	4TM-S1	Audio Coupling
C79	.0022	600	73585		P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Output Plate Byp. *
C80	.047	300	73787		P288-47		GT2P5		3TM-P47	Sync. Amp. Cath.
C81	.01	400	73561		P488-01	D6-103	PTE4S1	81L-01	4TM-S1	Sync. Coupling
C82	.0022	600	73585		P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Integrator Net.
C83	.0047	600	73920		P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Integrator Net.
C84	.0047	600	73920		P688-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Integrator Net.
C85	.01	600	73561		P688-01	D6-103	PTE6S1	81L-01	6TM-S1	Vert. Sync. Coupling
C86	.047	1000	73587		P1088-047		GT16S5		MB-S5	Vert. Discharge
C87	.22	600	74957		684-25		GT6P25		6TM-P25	Vert. Sweep Coupling
C88	.022	400	73582		P488-022		PTE4S2		4TM-S22	Fixed Trimmer
C89	.047	1000	73597		P1088-047		GT16S5		MB-S5	Fixed Trimmer
C90	.047	1000	73597		P1088-047		GT16S5		MB-S5	Fixed Trimmer
C91	.82	1000	73090		3182	TCZ-82	5WS7I	GP1K-82	1FM-31	Hor. Output Screen
C92	.82	1000	73090		3182				19C11	Hor. Feedback
C93	.047	400	73553		P488-047	DF-503	PTE4S5		4TM-S47	AFC Filter
C94	.022	400	73562		P488-022	DF-203	PTE4S2		4TM-S22	AFC Filter
C95	.47	200	73787		P288-47		GT2P5		2TM-P47	AFC Filter
C96	.047	600	73594		P688-047	DF-503	PTE6S5		6TM-S47	Hor. AFC Plate
C97	180	1300	74202		1469-3U02		D6-181	SR5T2	MS-32	Hor. Osc. Grid
C98	.01	600	73594		P688-01			PTE6S1	6TM-S1	Fixed Trimmer
C99	.001	1000	75643		P1088-001			PTE10D1	MB-D1	Hor. Discharge
C100	560	500	74250		1468-0005	D6-561	1WST6	GP2K-560	1FM-35	Hor. Sweep Coupling
C101	.82	1000	39396		32100	D6-101	5WS7I	GP1K-100	19C11	Hor. Output Screen
C102	.047	1000	73587		P1088-047		GT16S5		MB-S5	Hor. Output Screen
C103	.22	400	73794		P488-22		GT4P25		4TM-P22	Hor. Output Cath.
C104	4.7	600	74644							Hor. Sweep Coupling
C105	.018	1000	74727							Damper Filter
C106	.018	1000	74727							Damper Filter
C107	250	20000	74654		HV20B	TV1-502				HV Filter
C108	.01	600	75071		P688-01	D6-103	PTE6S1	81L-01	6TM-S1	Line Filter
C109	.01	600	75071		P688-01	D6-103	PTE6S1	81L-01	6TM-S1	Line Filter

* Some models use .0033MFD in this application. Mfgt's Part No. 73795.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.			Concentrikit			
B	50KΩ		75215	Bll-137 *	RTV-110	SBB-510	Vert. hold control-front
C	Shaft End			Bll-123 *			Horiz. hold control-rear
				E-187 *			Attach per instr. in "Concentrikit".
R2A	50KΩ		75514		RTV-193		Brightness control-front } See note 1
B	3500Ω						Contrast control and switch-rear }
R3A	2.5 Meg.			Concentrikit			
B	1.5 Meg.			Bll-139 *			Tone control-front
C	Shaft End		75513	B8-139ZX *			Volume control tapped at 250K, 500K, rear
D	Switch			E-187 *	RTV-194	SBT-219-S	Attach per instr. in "Concentrikit".
				76-1 *			Attach per instr. in "Concentrikit".
R4A	2.5 Meg.		71440	Q11-239	AM-84-S	AN-83	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R4A per instructions
R5A	5000Ω		71441	Q11-114	AM-19-S	AN-10	Vert. linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	2.0KΩ		75516	Q16-119	AM-37-U	B-34	Width control
B	Shaft		Not Req.	Not Req.	FKS-1/4		Attach to R6A per instructions

* Additional parts to be used with "Concentrikit".
Note 1. Chassis KC547 uses same control with out switch, part No. 75316.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R7	3900Ω			BTS-3900	RF Coil Shunt
R8	27Ω				RF Amp. Cathode
R9	3900Ω			BTS-3900	RF Amp. Grid
R10	150Ω			BTS-150	AGC Network
R11	18KΩ				RF Amp. Screen-See Note 2
R12	3300Ω			BTS-3300	RF Amp. Plate
R13	100Ω 20%			BTS-100	RF Amp. Plate Decoupling
R14	100KΩ				Series Test Point

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES
R15	8200Ω				RF Coil Shunt
R16	100KΩ				Conv. Grid
R17	100KΩ				Osc. Grid
R18	10KΩ				Osc. Plate
R19	10KΩ 5%				Conv. Transformer Shunt
R20	2.2 Meg.				AGC Network
R21	33KΩ				AGC Network
R22	1000Ω 20%			BTS-100	V. Diode Filter
R23	39KΩ	2			Decoupling
R24	39KΩ	2			Decoupling
R25	39KΩ	2			Decoupling
R26	10KΩ	2			Voltage Divider
R27	10KΩ				1st Video IF Transformer Shunt-See Note 3
R28	1000Ω 20%			BTS-1000	1st Video IF Transformer Shunt -See Note 3
R29	1000Ω 20%			BTS-1000	1st Video IF Transformer Shunt -See Note 3
R30	1000Ω 20%			BTS-1000	AGC Network
R31	120Ω			BTS-120	1st Video IF Amp. Plate
R32	33KΩ				1st Video IF Amp. Screen
R33	1000Ω 20%			BTS-1000	1st Video IF Amp. Plate Decoupling
R34	8200Ω 5%				2nd Video IF Amp. Grid
R35	1000Ω 20%			BTS-1000	AGC Network
R36	120Ω			BTS-120	2nd Video IF Amp. Cathode
R37	47KΩ				2nd Video IF Amp. Screen
R38	12KΩ 5%				2nd Video IF Amp. Plate
R39	1000Ω 20%			BTS-1000	2nd Video IF Amp. Decoupling
R40	470KΩ				Sound IF Amp. Grid
R41	82Ω			BTS-82	3rd Video IF Amp. Cathode
R42	33KΩ				3rd Video IF Amp. Screen
R43	3900Ω 5%			BTS-3900-5%	3rd Video IF Amp. Plate
R44	1000Ω 20%			BTS-1000	3rd Video IF Amp. Plate Decoupling
R45	180Ω			BTS-180	4th Video IF Amp. Cathode
R46	1000Ω 20%			BTS-1000	4th Video IF Amp. Screen
R47	33KΩ				4th Video IF Amp. Screen Decoupling
R48	8200Ω 5%				4th Video IF Amp. Plate
R49	1000Ω 20%			BTS-1000	4th Video IF Amp. Plate Decoupling
R50	33KΩ 20%			BTS-33K	AGC Network
R51	18KΩ			BTS-18K	AGC Network
R52	18KΩ			BTS-18K	AGC Network
R53	5600Ω 5%			BTS-5600-5%	Video Det. Diode Load
R54	220Ω			BTS-220	Video Amp. Cathode
R55	100KΩ 5%			BTS-100K-5%	Voltage Divider
R56	56KΩ			BTS-56K	Video Amp. Grid-See Note 4
R57	220Ω			BTS-220	Video Amp. Ca hode
R58	4700Ω 5%			BTS-4700-5%	Video Amp. Plate
R59	18KΩ			BTS-18K	Video Amp. Plate Decoupling-See Note 5
R60	6800Ω	2		BTB-6800	Decoupling
R61	6800Ω 5%			BTA-6800-5%	Video Amp. Plate
R62	470KΩ			MB-31	DC Ref. Load
R63	4700Ω			BTS-4700	Video Peaking
R64	390KΩ			BTS-390K	AGC Network
R65	150KΩ 20%			BTS-150K	AGC Network
R66	47KΩ			BTS-47K	AGC Network
R67	50KΩ			BTS-50K	Sync. Sep. Grid
R68	820KΩ			BTS-820K	Picture Tube Grid
R69	150KΩ			BTS-150K	Picture Tube Cathode
R70	82Ω			BTS-82	Sound IF Amp. Cathode
R71	1000Ω 20%			BTS-1060	Sound IF Amp. Decoupling
R72	47KΩ				Voltage Divider
R73	12KΩ				Limiter Screen
R74	1000Ω 20%			BTS-1000	Limiter Decoupling
R75	100KΩ 5%			BTS-100K-5%	Disc. Diode Load
R76	100KΩ 5%			BTS-100K-5%	Disc. Diode Load
R77	5.1Ω		72067		Disc. Filament-Wire Wound
R78	22KΩ 20%			BTS-22K	De-emphasis
R79	27KΩ			BTS-27K	Tone Compensation
R80	27KΩ			BTS-27K	Tone Compensation-See Note 5
R81	10 Meg. 20%			BTS-10 Meg.	AF Amp. Grid
R82	330KΩ			BTS-330K	AF Amp. Plate
R83	470KΩ 20%			BTS-470K	Audio Output Grid
R84	100Ω 20%			BTS-100	Audio Output Cathode
R85	390Ω			BTA-390	Audio Output Cathode
R86	470Ω	1		BTA-470	Audio Output Decoupling
R87	47KΩ			BTS-47K	Sync. Sep. Grid
R88	1.2 Meg.			BTS-1.2 Meg.	Sync. Sep. Grid
R89	12KΩ			BTS-12K	Voltage Divider
R90	2200Ω 20%			BTS-2200	Sync. Sep. Cathode
R91	18KΩ			BTA-18K	Sync. Sep. Plate
R92	18KΩ			BTS-18K	Voltage Divider
R93	22KΩ			BTS-22K	Voltage Divider
R94	22KΩ			BTS-22K	Integrator
R95	8200Ω			BTS-8200	Integrator
R96	8200Ω			BTS-8200	Integrator
R97	1.2 Meg. 5%			BTS-1.2 Meg. 5%	Voltage Divider
R98	3.3 Meg. 5%			BTS-3.3 Meg. 5%	Vert. Osc. Grid
R99	1 Meg. 20%			BTS-1 Meg.	Vert. Osc. Transformer Shunt
R100	270KΩ			BTS-270K	Vert. Osc. Plate
R101	12KΩ			BTS-12K	Vert. Peaking
R102	2.2 Meg.			BTS-2.2 Meg.	Vert. Output Grid
R103	1500Ω			BTA-1500	Vert. Output Cathode
R104	15KΩ			BTS-15K	Vert. Linearity Control Shunt
R105	220KΩ			BTS-220K	Vert. Peaking
R106	1000Ω 20%			BTS-1000	Vert. Output Decoupling
R107	220KΩ			BTS-220K	Vert. Osc. Decoupling
R108	150KΩ			BTS-150K	Decoupling
R109	1 Meg. 20%			BTS-1 Meg.	Voltage Divider
R110	150KΩ			BTS-150K	Horiz. Feedback
R111	330KΩ			BTS-330K	Horiz. AFC Grid
R112	820KΩ			BTS-820K	Horiz. AFC Grid
R113	330KΩ 5%			BTA-330K-5%	Horiz. AFC Cathode
R114	82KΩ			BTA-82K	Horiz. AFC Cathode
R115	3900Ω			BTS-3900	Horiz. AFC Filter Network
R116	150KΩ 5%			BTA-150K-5%	Horiz. Osc. Grid
R117	8200Ω 5%			BTS-8200-5%	Horiz. Osc. Transformer Shunt
R118	82KΩ 5%			BTA-82K-5%	Horiz. Osc. Plate
R119	1 Meg.			BTS-1 Meg.	Horiz. Output Grid

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA PART No.	IRC PART No.	IDENTIFICATION CODES
R120	47Ω				Parasitic Suppressor
R121	100Ω	2		BW-2-100	Horiz. Output Cathode
R122	82KΩ	1		BTA-82K	Voltage Divider
R123	68KΩ	1		BTA-68K	Voltage Divider
R124	6800Ω 5%	1		BTA-6800-5%	Horiz. Output Screen-See Note 6
R125	33KΩ			BTS-33K	Width Control Shunt
R126	4000Ω	10	75512	1 3/4A-4000	Filter-Wire Wound
R127	50KΩ	1		BTA-50K	Filter
R128	27KΩ	2		BTB-27K	Filter
R129	15KΩ	2		BTB-15K	Bleeder
R130	12KΩ	2		BTB-12K	Bleeder
R131	12KΩ	2		BTB-12K	Bleeder
R133	100KΩ 20%	2		BTB-100K	Line Filter

Note 1. Some models use a 22KΩ resistor in this application.
Note 3, Not used in all models.
Note 4. Some models use a 390KΩ resistor in this application.
Note 5. Some models use a 22KΩ resistor in this application.
Note 6. Some models use a 8200Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ① 1.8A	720VCT .5VAC ② 1.2A		6.3VAC ③ 3A	75508	P-8160 ② P-6134 ②		TP-370 ④

① Drill new mounting holes.
② Mount where space permits and use for SEC. 3

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	165Ω	13.0Ω	74144	A-8122	A-4000 ①	TBO-2	Vert. Block Osc. Trans.
T3	250Ω Tap ① 220	0Ω	75519				Hor. Output Trans.
T4	465Ω	4.4Ω	74950				Vert. Output Trans.
T5A	44Ω		74952				Hor. Deflection Coil
B	3.6Ω						Vert. Deflection Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T6	7500Ω	4Ω 400Ω	.6Ω		75520	A-8114 ①	A-3020	RO-13 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA RCA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	PM	4Ω	75022 ②	ST-118 MOD.P8-U	8A21	② Used in models 6T54, 6T64. ③ Used in models 6T65, 6T71, 6T74, 6T75, 6T76.
B	PM		74974 ③			
	CONE DIA.	V. C. DIA.				
SP2A	7 1/4"	3/4"	75024			
B	9 1/2"		74901			

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.200ADC	43Ω	1.3 Henries	73154	C-2326 ①	C-2991	TR-3300 ①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RCA PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L2	Ant. Coil	.6Ω	.6Ω	73591 *		* Part of antenna matching unit. Refer misc.
L3	Ant. Coil	.6Ω	.6Ω	73591 *		
L4	IF Trap	.7Ω		75242 *		Wound on 18MMF includes L5
L5	IF Trap	.7Ω		75242 *		Wound on 18MMF includes L4
L6	Ant. Shunt	.4Ω		75241 *		
L7	FM Trap	0Ω		75449 *		Includes C7
L8	Ant. Coils	0Ω		75180		Complete with stator, rotor, R7, R9, R10, C8, C9
L9	Fil. Choke	0Ω		73477		
L10	RF Trimmer	0Ω		75183		Includes trimmer capacitor
L11	RF Coils	0Ω		75179		Complete with stator, rotor, R12, C13
L12	Mixer Grid Coils	0Ω		75178		Complete with stator, rotor, R14, R15, R16, C14, C16
L13	Mixer Grid Trimmer	0Ω		75182		Includes trimmer capacitor
L14	Osc. Coils	0Ω		75175		Complete with stator, rotor, C20, C21
L15	Fil. Choke	0Ω				
L16	Mixer Plate Loading Coil	0Ω		75185		

RCA VICTOR MODELS 6T54, 6T64, 6T65, 6T71, 6T74, 6T75, 6T76 (Ch. KCS47, A)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF -IF) CONT.

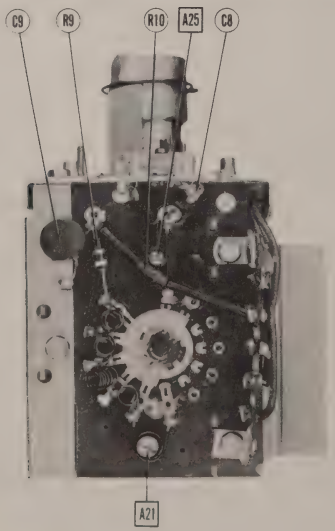
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	RCA PART No.	MEISSNER PART No.	
L17	RF Choke	.3Ω		75202		.56 microhenries
L18	Conv. Trans.	.3Ω	.1Ω	75181		
L19	1st Video IF	.1Ω	5Ω	74589		With trap
L20	Fil. Choke	0Ω		73477		
L21	2nd Video IF			74590		With trap
L22	3rd Video IF -Sound Take Off	.3Ω	.1Ω	75209		
L23	Fil. Choke	0Ω		73477		
L24	4th Video IF	.1Ω	.1Ω	74592		With trap
L25	Sound Trap	.1Ω	0Ω	71778		Includes C49
L26	5th Video IF	.5Ω		75210		
L27	Peaking	3Ω		75299		36 microhenries, wound on 10 Meg. resistor
L28	Peaking	5.5Ω		75253	19-1921	120 microhenries, blue-red dots
L29	Peaking	2.7Ω		71793		36 microhenries, black dot
L30	Peaking	5.5Ω		75253	19-1921	120 microhenries, blue-red dots
L31	Peaking	13Ω		75252	19-1923	500 microhenries, green-white dots
L32	4.5MC Trap	2.7Ω		75251		Wound on 47MMF capacitor, green-yellow dots
L33	Sound IF	.3Ω		75211		
L34	Disc. Trans.	.1Ω	.1Ω	75212		
L35	Horiz. Osc. Trans.	80Ω	48Ω	75213		
L36	Horiz. Lin.	30Ω		71449		

DIAL LIGHTS

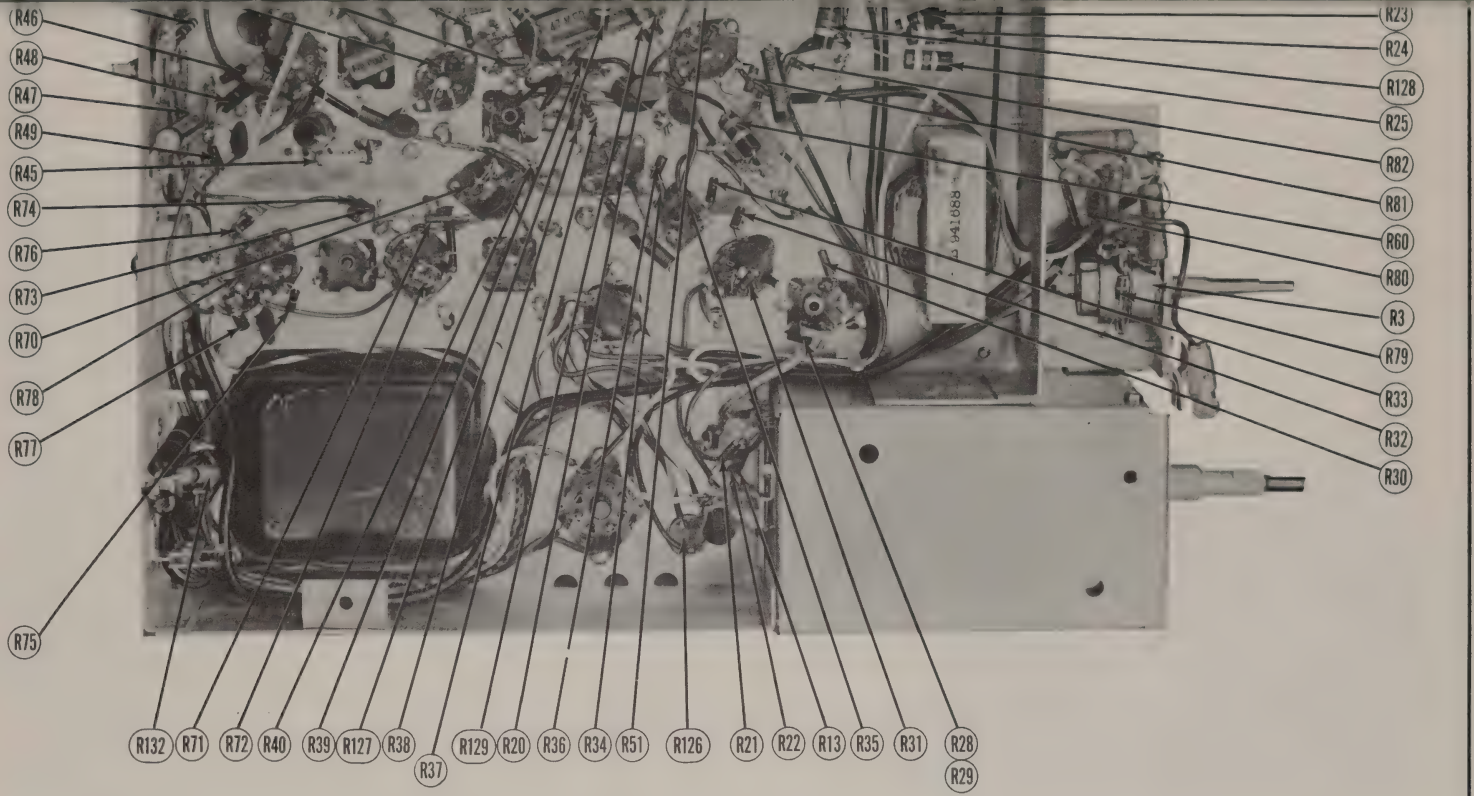
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					RCA PART No.		
M1	Bayonet	7.5	.2	White	11765		Type #51
M2	Bayonet	7.5	.2	White	11765		Type #51 (Jewel)

MISCELLANEOUS

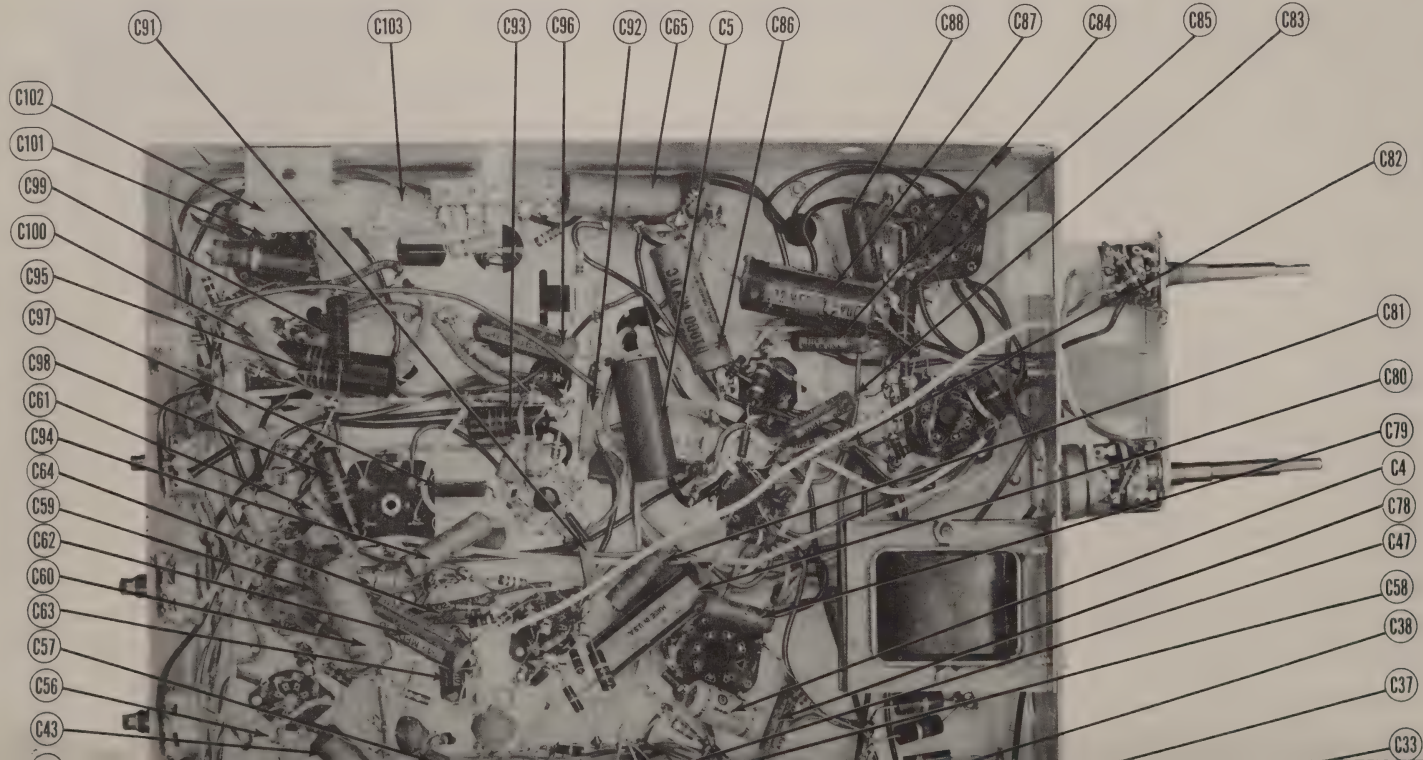
ITEM No.	PART NAME	RCA PART No.	NOTES
M3	RF Tuner		
M4	Fuse	73600	.25A 250V Type BEL
M5	Switch		TV-Phono
M6	Switch		AGC Control
M7	Ion Trap	74953	
M8	Focus Magnet	75504	Complete with adjustable plate and stud
	Safety Glass	74606	Models 6T64, 6T51, 6T71, 6T74, 6T75, 6T76
	Safety Glass	75530	Model 6T54
	Knob	74960	Channel selector, maroon
	Knob	74961	Channel selector, tan
	Knob	75462	Channel selector, beige
	Knob	74959	Fine tuning, maroon
	Knob	73995	Fine tuning, tan
	Knob	75461	Fine tuning, beige
	Knob	74962	Tone, Brightness, Vert. hold, maroon
	Knob	73999	Tone, Brightness, Vert. hold, tan
	Knob	75463	Tone, Brightness, Vert. hold, beige
	Knob	74963	Contrast, Horiz. hold, volume, maroon
	Knob	74001	Contrast, Horiz. hold, volume, tan
	Knob	75464	Contrast, Horiz. hold, volume, beige
	Escutcheon	75455	Channel selector, mahogany or walnut cabinets.
	Escutcheon	75456	Channel selector, maple or oak cabinets.
	Escutcheon	75499	Channel selector, metal cabinets.
	Antenna Matching Unit	75509	



RF TUNER-REAR VIEW



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION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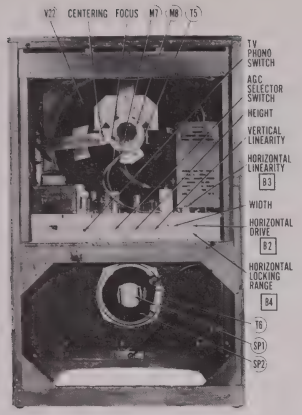


CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Connect a short between terminals C and D of L35.
Turn the set on and tune in a TV station preferably a test pattern.
Turn the horizontal hold control fully clockwise and adjust the horizontal frequency slug (B1) until the blanking signal appears as a single vertical line in the raster.
Turn the hold control 1/4 turn counter-clockwise to sync the picture.
Adjust the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right side of the picture. Adjust the width control until the picture is of proper width. Adjust the horizontal linearity slug (B3) until the picture is symmetrical from left to right. A slight readjustment of B2 may be necessary for optimum results.
Turn the hold control fully counter-clockwise and momentarily remove the signal by switching to another channel and back again.
Turn the hold control slowly clockwise and note the least number of bars present just before the picture pulls into synchronization.
Adjust the horizontal locking trimmer (B4) until 7 to 9 bars are present just before pull in.

HORIZONTAL OSCILLATOR WAVEFORM ADJUSTMENT

Remove the short from terminals C and D of L35.
Turn the horizontal hold control fully clockwise, and adjust the waveform adjustment (B5) until the blanking signal appears in the picture as a single vertical line.
Turn the hold control counter-clockwise 1/4 turn to synchronize the picture.
Connect the low capacity probe of an oscilloscope to terminal C of L35 and chassis.
Adjust B5 until the broad and narrow peaks of the waveform are of equal height as shown in figure 7. If necessary during this adjustment turn the hold control to keep the picture in sync.
Turn the hold control to maximum counter-clockwise and momentarily remove the signal. Adjust B4 until 2 bars are present just before pull in as the hold control is turned clockwise.
Turn the horizontal hold control to maximum clockwise and adjust B1 until the blanking bar appears in the picture as a single vertical line. Turn the hold control 1/4 turn counter-clockwise to synchronize the picture.

FIG. 7

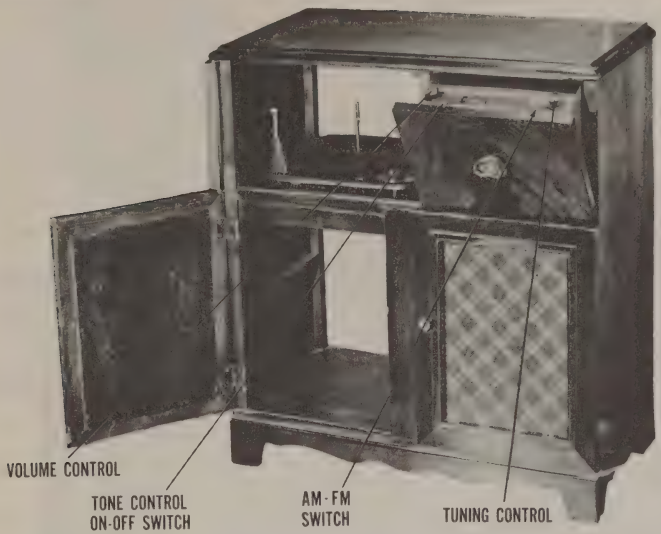
AGC SWITCH ADJUSTMENT

In a strong signal area the normal position of the AGC switch is in the counter-clockwise position. If an interference of the impulse type is encountered turn the switch to the center position. In very weak signal areas turn the switch fully clockwise.

FM TRAP ADJUSTMENT

If interference is encountered from a strong FM station signal it may be eliminated by adjusting the trap coil A38

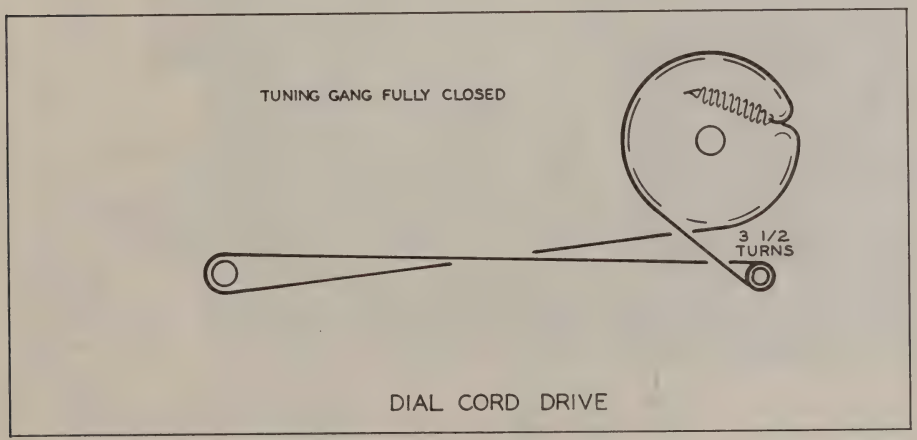
SILVERTONE
MODELS 64, 65 (Ch. 101.859-2)



SILVERTONE MODEL 64

TRADE NAME	Silvertone, Models 64, 65 (Ch. 101.859-2)	
SUPPLIER	Sears, Roebuck and Co., 925 So. Homan St., Chicago, Illinois	
TYPE SET	AC Operated Combination Phono-Radio, AM-FM Superheterodyne Receiver with Loop Antenna	
TUBES (SEVEN)	Types 7F8 Converter, 6BA6 1st IF Amp., 6BA6 2nd IF Amp., 7A6 Discriminator, 7R7 AM DET-AVC-AF, 7C5 Power Output, 7Y4 Rectifier	
POWER SUPPLY	110-120 Volts AC	RATING .43 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1600KC	FREQ. MOD. 88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER SEE SILVERTONE MODEL 101.216 SIMILAR TO V-M MODEL 950. SEE PHOTOFACT FOLDER SET #107 FOLDER #13 OR RECORD CHANGER MANUAL CM-3



DIAL CORD DRIVE

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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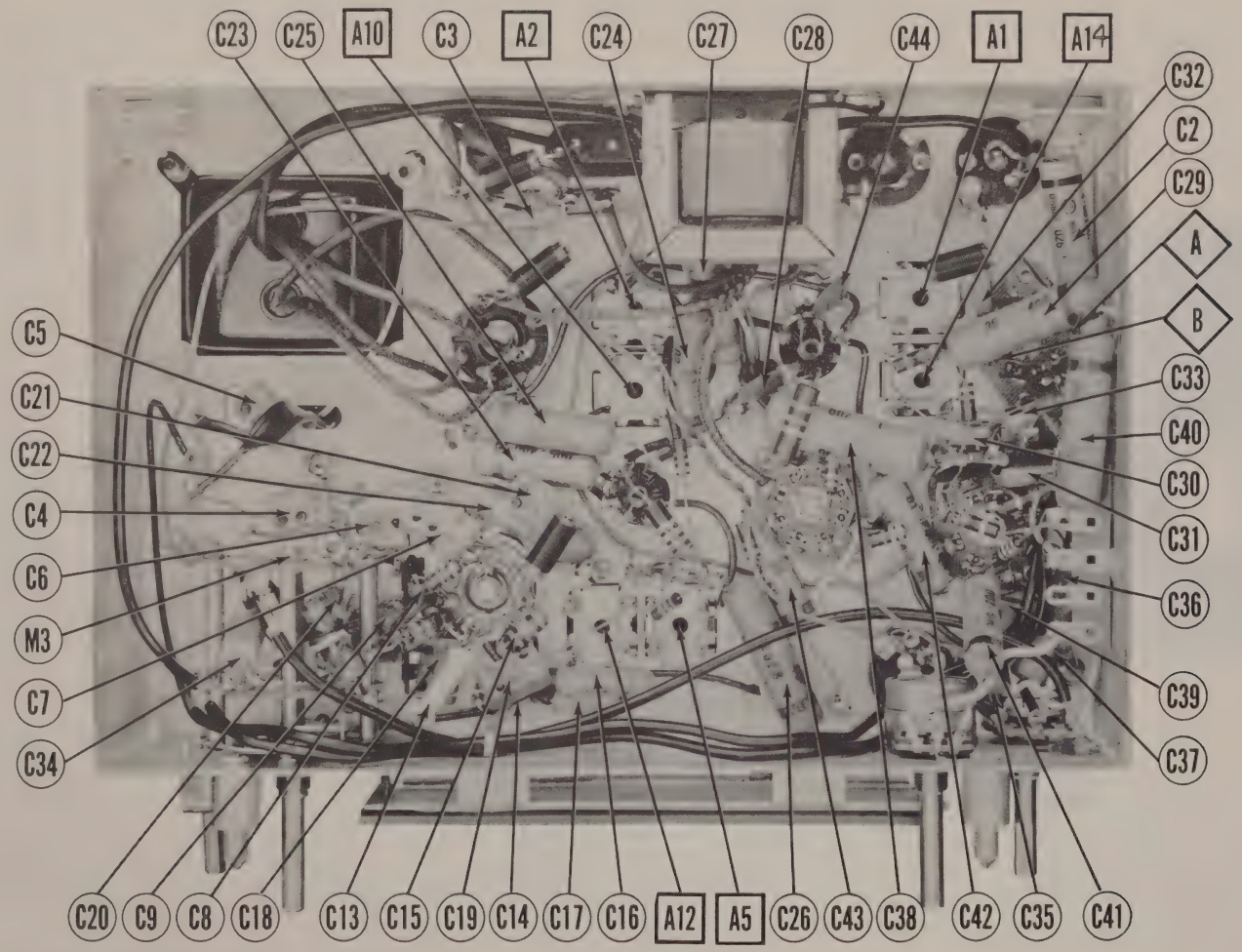
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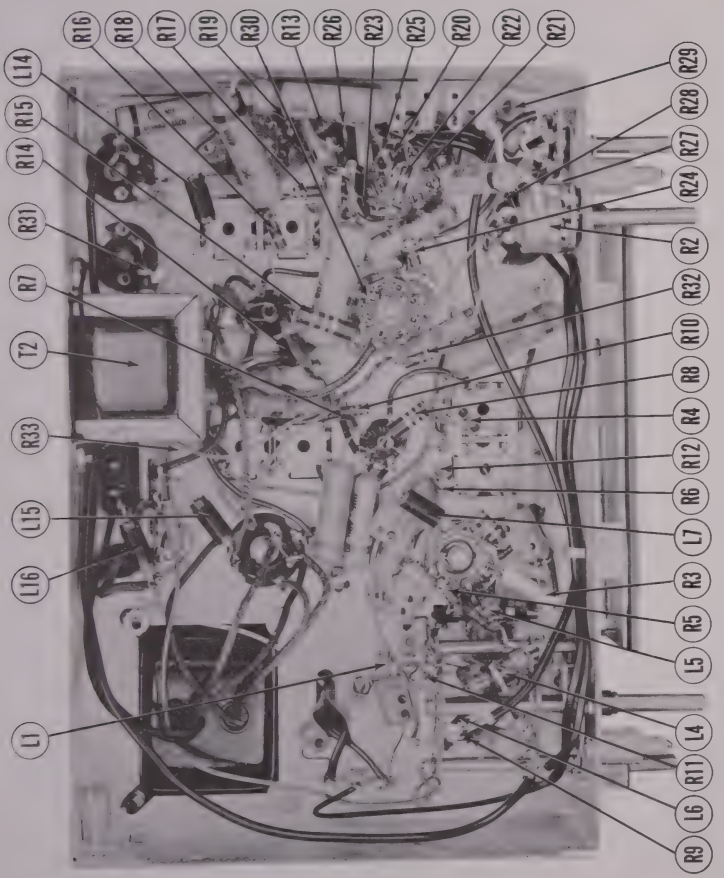

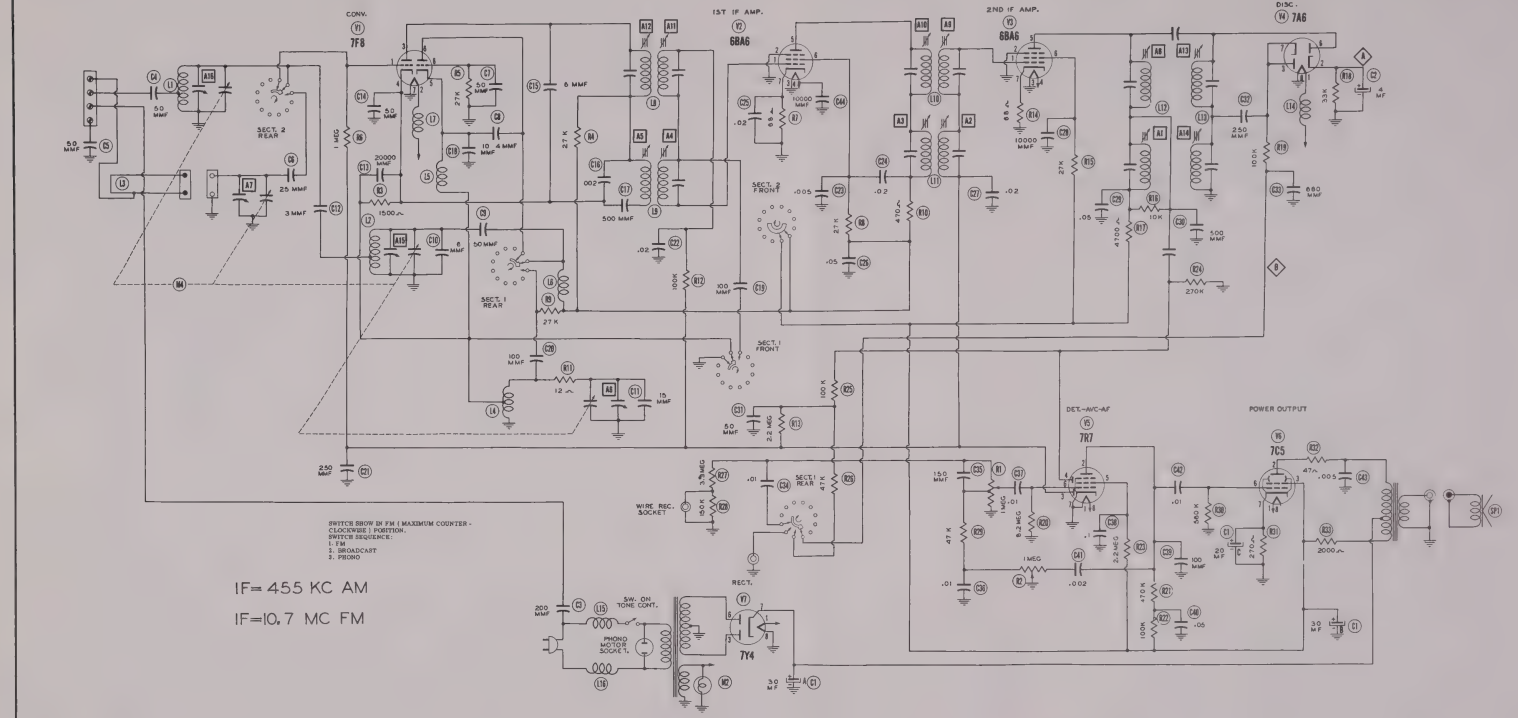

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	7F8	80V 6.-.5VDC	6.3VAC	145VDC ±150VDC	33.5VDC ±3VDC	0V	118VDC ±13VDC	0V.	14-2.5VDC ±2-1.4VDC
V 2	6BA6	-.5VDC	0V.	0V.	6.3VAC	116VDC ±13VDC	116VDC ±16VDC	.8VDC	
V 3	6BA6	-.8VDC	0V.	0V.	6.3VAC	115VDC ±15VDC	116VDC ±15VDC	.8VDC	
V 4	7A6	6.3VAC	1.7VDC	1.4VDC	1.3VDC	80V.	80V.	1.4VDC	0V.
V 5	7R7	0V	30VDC	-.6VDC	-2.1VDC	30VDC	-.8VDC	0V.*	6.3VAC
V 6	7C5	0V.	250VDC	250VDC	250VDC	300VDC	0V.	10VDC	6.3VAC
V 7	7Y4	6.3VAC	0V.	345VAC	0V.	0V.	345VAC	375VDC	0V.

§ TAKEN WITH VACUUM TUBE VOLTMETER.
† TAKEN IN "FM" POSITION.
▲ TAKEN IN "AM" POSITION.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	7F8	0 Ω ±3.0 Meg.	1.1Ω	738KΩ	1.5KΩ	±2.5Ω	1L.8Ω ±39KΩ	120000Ω ±39KΩ	27KΩ
V 2	6BA6	150000Ω ±2.7 Meg.	0Ω	0Ω	.1Ω	12.5KΩ	170KΩ	660Ω	
V 3	6BA6	170000Ω ±2.0 Meg.	0Ω	0Ω	.1Ω	16.7KΩ	120KΩ	680Ω	
V 4	7A6	.1Ω	330Ω	2MΩ	Inf.	0Ω	2.8Ω	Inf.	0Ω
V 5	7R7	0Ω	1270KΩ	1700KΩ ±3.6 Meg.	±370KΩ	12.5 Meg.	10 Meg.	0Ω	1Ω
V 6	7C5	0Ω	172Ω	120000Ω	187Ω	130000Ω	160KΩ	210Ω	.1Ω
V 7	7Y4	.1Ω	0Ω	1950 "	Inf. Inf.	Inf. Inf.	195Ω 195Ω	60KΩ	0Ω

† MEASURED FROM PIN 7 OF V7.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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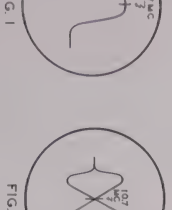
1070 KC
FIG. 1
107 KC
FIG. 2

| | | |

PHOTOFACT* Folder

SYLVANIA MODELS
1-125-1, 1-197-1, 1-245-1,
1-246-1 (CH. 1-186)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

MODEL 1-246-1

SYLVANIA MODELS
1-125-1, 1-197-1, 1-245-1,
1-246-1 (CH. 1-186)

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Date 11/50 Set No. 113—Folder No. 9

SYLVANIA MODEL 1-246-1

TRADE NAME	Sylvania, Models 1-125-1, 1-197-1, 1-245-1, 1-246-1 (Ch. 1-186 Codes B15, C15 and Up.)
MANUFACTURER	Sylvania Elect. Prod., Inc., Colonial Radio and Tel. Div., 254 Rano St., Buffalo, New York
TYPE SET	Television Receiver
TUBES	Twenty Eight
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2.25 Amp. at 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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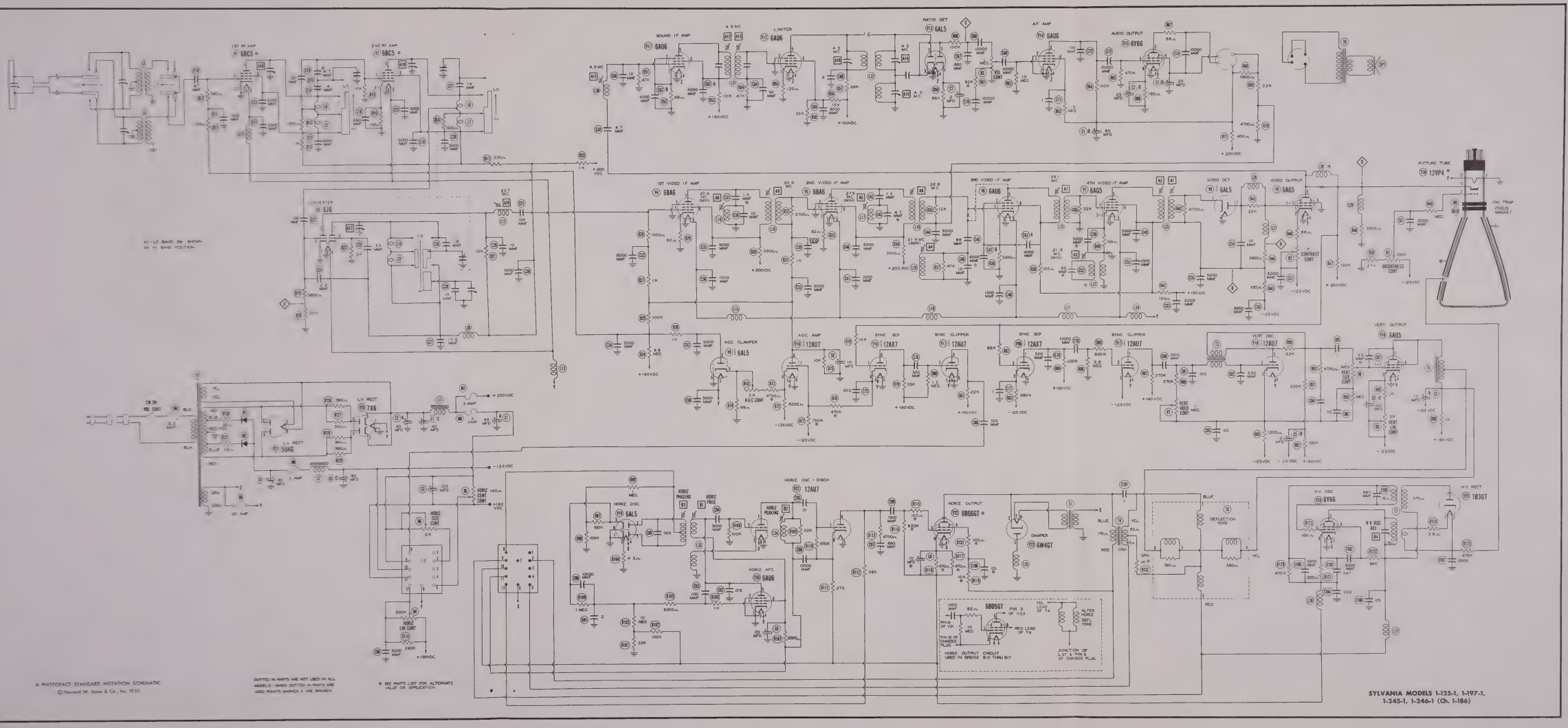
SYLVANIA MODELS 1-125-1, 1-197-1, 1-245-1, 1-246-1 (Ch. 1-186)


SYLVANIA MODELS 1-125-1, 1-197-1, 1-245-1, 1-246-1 (Ch. 1-186)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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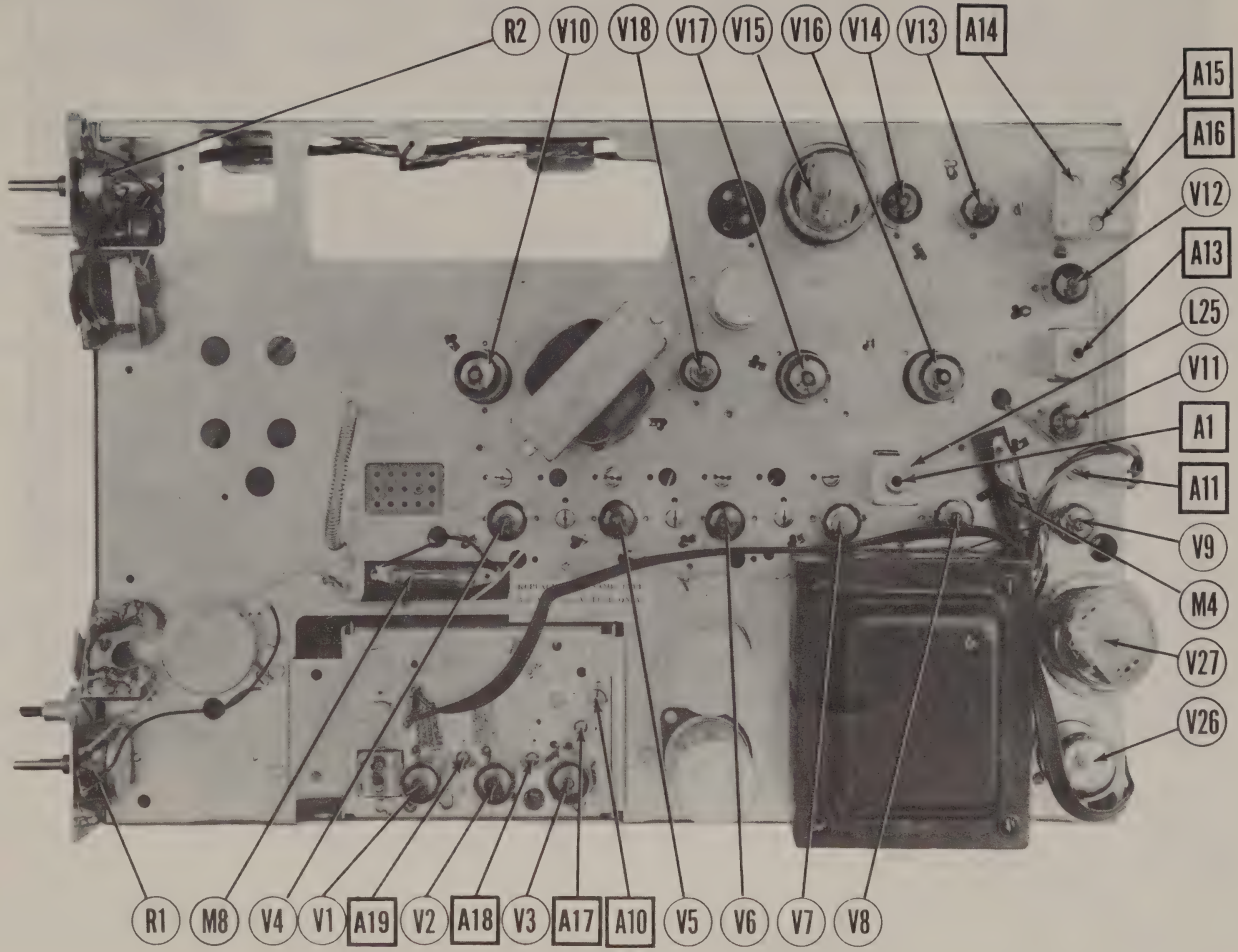
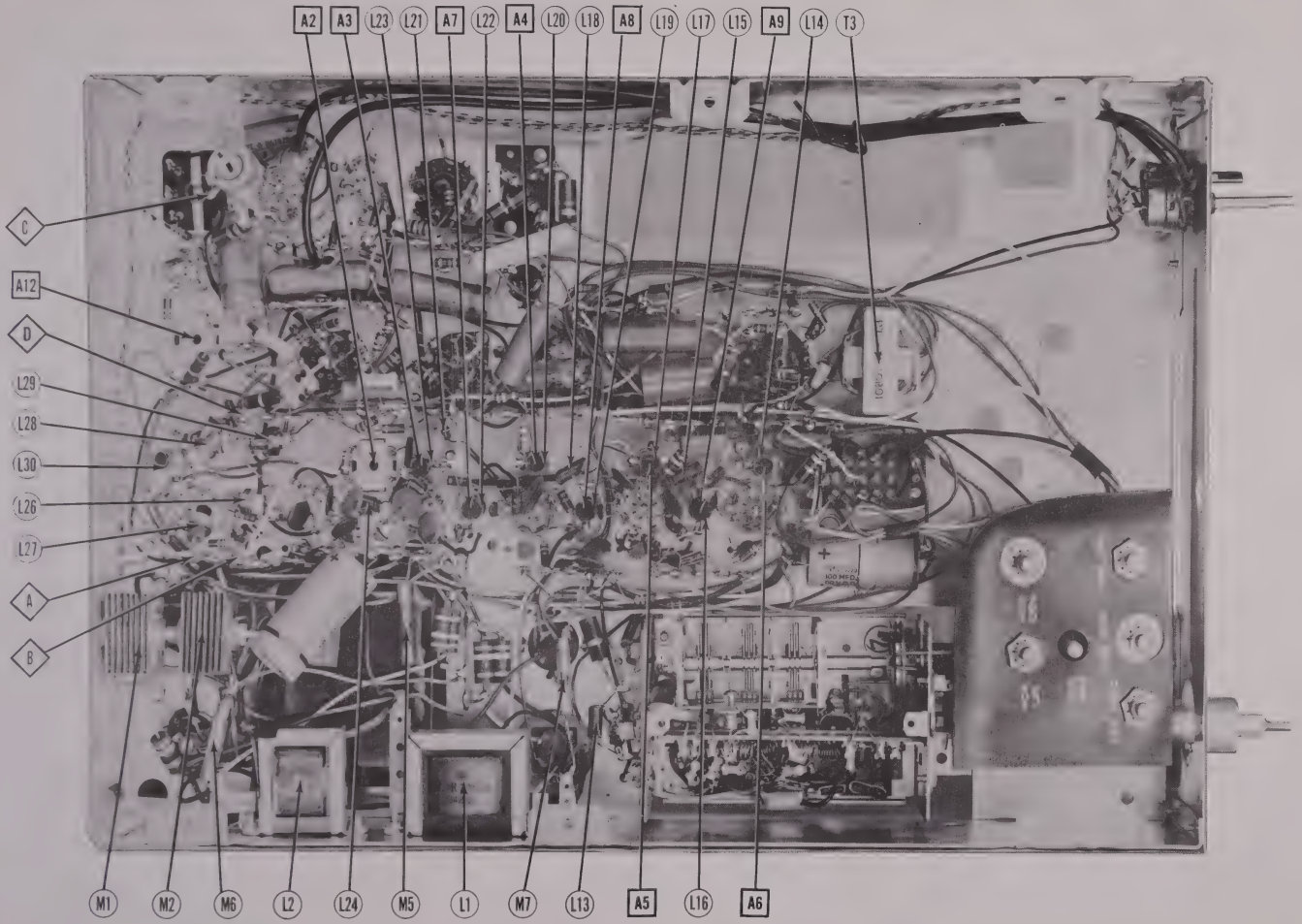
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
SYLVANIA MODELS 1-125-1, 1-197-1, 1-245-1, 1-246-1 (Ch. 1-186)

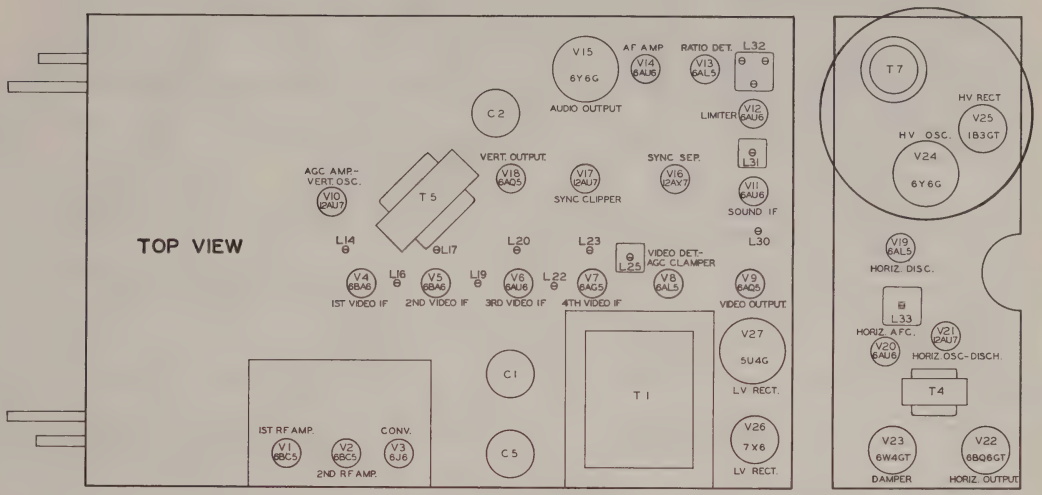


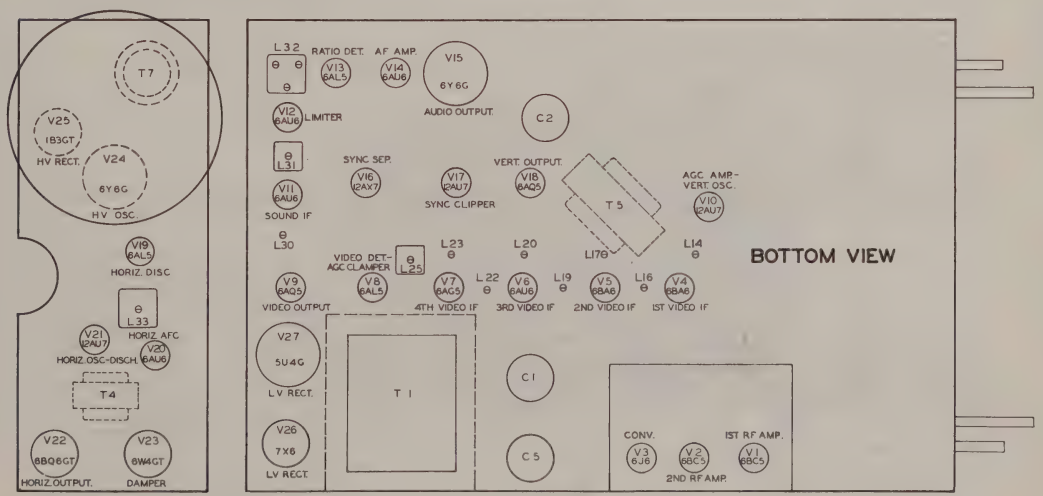
CHASSIS TOP VIEW

SYLVANIA MODELS 1-125-1, 1-197-1, 1-245-1, 1-246-1 (Ch. 1-186)



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

SYLVANIA MODELS 1-125-1, 1-197-1, 1-245-1, 1-246-1 (Ch. 1-186)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the HV oscillator tube (V24) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V3) and replace with a 6J6 with pin 1 removed to prevent erroneous indications.
Connect the negative terminal of a 3 volt battery to pin 6 of the AGC amplifier tube (V10). Connect the positive terminal to chassis.
It should be noted that the common lead of the VTVM is at 125 volts below ground, avoid touching or grounding the VTVM case.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.005MFD	High side to pin 1 (Grid) of 6AG5 (V7). Low side to chassis.	24MC (10MC SWP)	23MC 27MC	Any	Vert. Amp. to Point (A). Low side to chassis.	A1, A2	Adjust for response curve similar to figure 1 with markers as shown.
2.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V3). Low side to chassis.	Not used	21.9MC	"	Use VTVM. DC Probe to Point (A). Common to Point (B).	A3, A4	Adjust for minimum deflection.
3.	Direct	"	"	27.9MC	"	"	A5	"
4.	Direct	"	"	20.4MC	"	"	A6	"
5.	Direct	"	"	26.1MC	"	"	A7	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum -3 volts reading.
6.	Direct	"	"	22.8MC	"	"	A8	"
7.	Direct	"	"	25MC	"	"	A9	"
8.	Direct	"	"	23.7MC	"	"	A10	Adjust for maximum deflection. Repeat step 2.
9.	Direct	"	24MC (10MC SWP)	22.75MC 23MC 26.4MC	"	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 2. The 26.4MC marker should beat 50% response. If necessary, SLIGHTLY retouch A7 thru A10 for proper response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.005MFD	High side to pin 7 (Grid) of 6AG5 (V9). Low side to chassis.	4.5MC	Any	DC Probe thru detector probe as shown in figure 3 to Point (C). Common to chassis.	A11	Adjust for minimum deflection.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	.005MFD	High side to pin 7 (Grid) of 6AG5 (V9). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. thru 39KΩ to pin 1 (Grid) of 6AU6 (V12). Low side to chassis.	A12, A13	Adjust for maximum amplitude and symmetry as per figure 4.
12.	.005MFD	"	"	"	"	Vert. Amp. to Point (D). Low side to chassis.	A14, A15, A16	Adjust A14 and A15 to place 4.5MC at center of diagonal line as per figure 5. Adjust A16 for maximum amplitude and straightness of diagonal line.

RF TUNER ALIGNMENT

Remove dummy converter tube and replace original 6J6 in its socket.
Connect a 3 volt battery as in Video IF Alignment.
Connect a 2000Ω resistor from pin 1 of V4 and chassis.
The two trimmer capacitors located near the front of the tuner are for the purpose of adjusting the antenna input circuits. Those trimmers are pre-set at the factory and sealed, they should not be adjusted in the field.
Set the fine tuning control to the mid-position of its range.

HIGH BAND OSCILLATOR ALIGNMENT

Turn the tuner switch to high band position (counter-clockwise).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	21.9MC 217.25MC	Tuning gang fully open	Vert. Amp. to Point (E). Low side to chassis.	A17	Adjust so 21.9MC and 217.25MC markers coincide at 100% response as shown in figure 6.
14.	"	"	177MC (10MC SWP)	21.9MC 177.25MC	Tuning gang fully closed	"	L10	Expand or compress coil turns so 21.9MC and 177.25MC markers coincide at 100% response as shown in figure 7. Repeat steps 12 and 13 until no further improvement can be made.

HIGH BAND RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
15.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	21.9MC 26.4MC	Tuning gang fully open	Vert. Amp. to Point (E). Low side to chassis.	A18, A19	Adjust A18 for maximum amplitude at the 26.4MC point as per Fig. 7. Adjust A19 for maximum amplitude and at the 21.9MC point on response curve.
16.	"	"	177MC (10MC SWP)	"	Tuning gang fully closed	"	L6, L8	Expand or compress coil turns of L6 for maximum amplitude at the 26.4MC point on response curve. Adjust turns of L8 for maximum amplitude at the 21.9MC point on response curve. Repeat steps 14 and 15 until no further improvement can be made.

ALIGNMENT INSTRUCTIONS (CONT.)

LOW BAND OSCILLATOR ALIGNMENT

Turn the tuner switch to low band position (clockwise).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	21.9MC 89.25MC	Tuning gang fully open	Vert. Amp. to Point E . Low side to chassis.	L9	Expand or compress coil turns so the 21.9MC and 89.25MC markers coincide at 100% on response curve as shown in figure 8.
18.	"	"	57MC (10MC SWP)	21.9MC 58.75MC	Tuning gang fully closed	"		Check the coincidence of 21.9MC and 58.75MC markers. If they are not within 1/2MC, it will be necessary to compromise between the high and low band. There should be no more than 1/2MC difference between the markers on any channel.

LOW BAND RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	21.9MC 26.4MC	Tuning gang fully open	Vert. Amp. to Point E . Low side to chassis.	L5, L7	Expand or compress the coil turns of L5 for maximum amplitude at 26.4MC point as per Fig. 8. Adjust turns of L7 for maximum amplitude at the 21.9MC point on the response curve. Check all low band channels. If the markers fall below 70%, or the dip which may appear exceeds 30% on any channel, a compromise adjustment of L5 and L7 will be required.

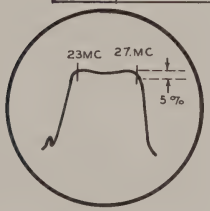


FIG.1

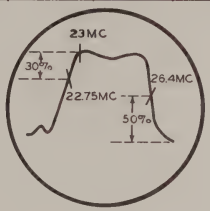


FIG.2

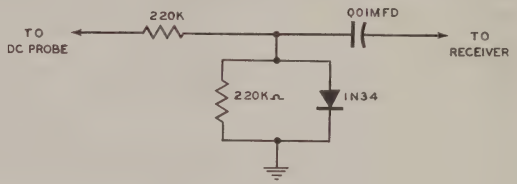


FIG.3

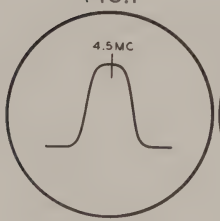


FIG.4

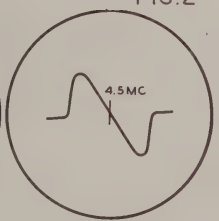


FIG.5

FIG.6

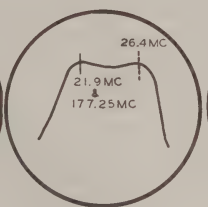


FIG.7

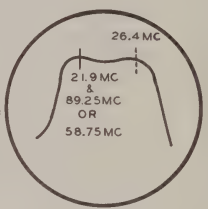
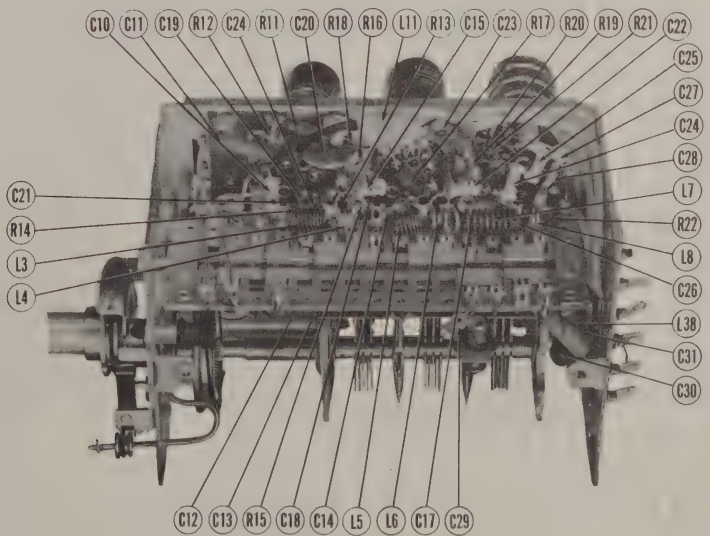


FIG.8



RF TUNER

SYLVANIA MODELS 1-125-1, 1-197-1, 1-245-1, 1-246-1 (Ch. 1-186)

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-.8VDC	0V.	6.3VAC	0V.	120VDC	120VDC	0V.		
V 2	6BC5	-.2VDC	.9VDC	6.3VAC	0V.	145VDC	145VDC	.9VDC		
V 3	6J6	120VDC	65VDC	0V.	6.3VAC	-3.2VDC	§-3.3VDC	0V.		
V 4	6BA6	-.1VDC	0V.	0V.	6.3VAC	120VDC	120VDC	1.4VDC		
V 5	6BA6	-.1VDC	0V.	0V.	6.3VAC	120VDC	120VDC	1.4VDC		
V 6	6AU6	15VDC	28VDC	0V.	6.3VAC	190VDC	190VDC	28VDC		
V 7	6AG5	0V.	2.6VDC	0V.	6.3VAC	190VDC	190VDC	2.6VDC		
V 8	6AL5	-125VDC	-.8VDC	6.3VAC	0V.	-.5VDC -.7VDC	0V.	-125VDC		
V 9	6AQ5	#9.7VDC	#20VDC	0V.	6.3VAC	#115VDC	0V.	#9.7VDC		
V 10	12AU7	#175VDC	#-40VDC #-22VDC	#11VDC	6.3VAC	6.3VAC	#135VDC	#70VDC	#80VDC	0V.
V 11	6AU6	-1.2VDC	.6VDC	0V.	6.3VAC	100VDC	100VDC	.6VDC		
V 12	6AU6	-.6VDC	0V.	0V.	6.3VAC	8.8VDC	95VDC	.8VDC		
V 13	6AL5	4.8VDC	0V.	0V.	6.3VAC	5.4VDC	0V.	5.4VDC		
V 14	6AU6	-1.7VDC	0V.	0V.	6.3VAC	150VDC	27VDC	0V.		
V 15	6Y6G	0V.	0V.	150VDC	135VDC	0V.	0V.	6.3VAC	12VDC	
V 16	12AX7	#275VDC	#112VDC	#115VDC	0V.	0V.	#330VDC	#112VDC	#115VDC	6.3VAC
V 17	12AU7	#26VDC	#5.4VDC	#10VDC	6.3VAC	6.3VAC	65VDC	.1VDC	0V.	0V.
V 18	6AQ5	#-2.2VDC #-1.2VDC	#45VDC #32VDC	0V.	6.3VAC	#305VDC	#305VDC	#-2.2VDC #-1.2VDC		
V 19	6AL5	0V.	-16VDC	1VAC	6.3VAC	-.4VDC	0V.	-16VDC		
V 20	6AU6	-4VDC	0V.	0V.	6.3VAC	180VDC	180VDC	0V.		
V 21	12AU7	190VDC 198VDC	-12VDC	.2VDC	0V.	0V.	#250VDC #115VDC	#32VDC	#70VDC	6.3VAC
V 22	6BQ6GT	0V.	0V.	#210VDC #175VDC	#210VDC #175VDC	#2.4VDC	0V.	6.3VAC	#38VDC	TOP CAP •
V 23	6W4GT	0V.	0V.	•	0V.	135VDC	330VDC	¶	¶	
V 24	6Y6GT	0V.	0V.	#320VDC	#120VDC	#-16VDC	#-16VDC	6.3VAC	#18VDC	
V 25	1B3GT		• DO NOT MEASURE.							
V 26	7X6	6.3VAC	210VDC	195VAC	135VAC	135VAC	195VAC	210VDC	0V.	
V 27	5U4G	0V.	210VDC	0V.	215VAC	0V.	215VAC	0V.	210VDC	
V 28	12VP4	0V.	-100VDC	PIN 11 -20VDC	PIN 12 6.3VAC					

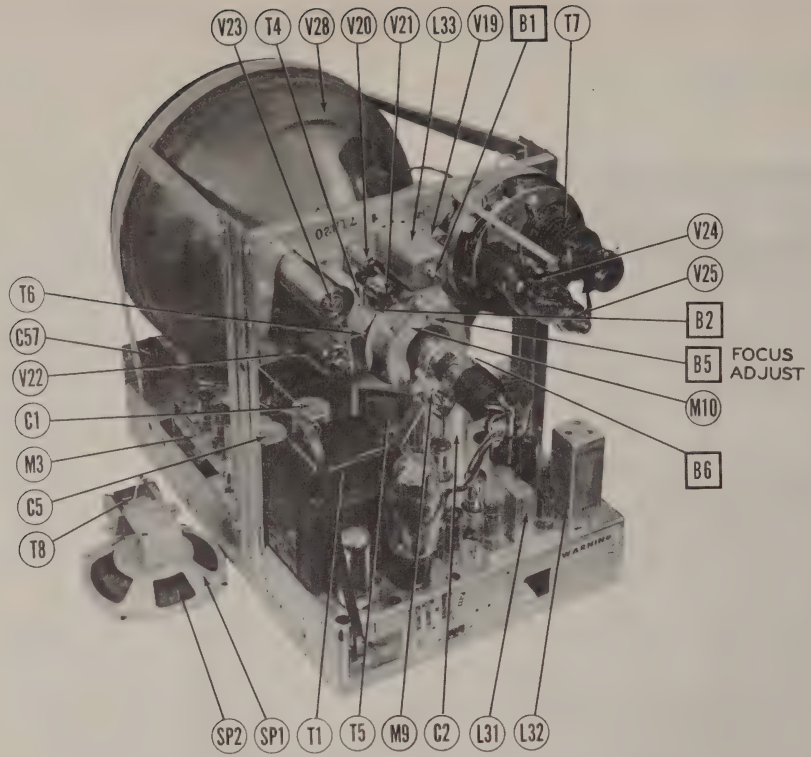
MEASURED FROM JUNCTION OF M1 and M2.
¶ 6.3VAC MEASURED ACROSS FILAMENTS.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
• DO NOT MEASURE.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	110KΩ	0Ω	.1Ω	0Ω	†2.2KΩ	†2.2KΩ	0Ω		
V 2	6BC5	10KΩ	100Ω	.1Ω	0Ω	†1.2KΩ	†1.2KΩ	100Ω		
V 3	6J6	†1000Ω	†11KΩ	0Ω	.1Ω	105KΩ	10KΩ	0Ω		
V 4	6BA6	13KΩ	0Ω	0Ω	.1Ω	†4KΩ	†4KΩ	82Ω		
V 5	6BA6	11KΩ	0Ω	0Ω	.1Ω	†4KΩ	†4KΩ	82Ω		
V 6	6AU6	4.7KΩ	3.3KΩ	0Ω	.1Ω	†270Ω †320Ω	†270Ω †370Ω	3.3KΩ		
V 7	6AG5	.7Ω	150Ω	0Ω	.1Ω	†190Ω †250Ω	†190Ω †250Ω	150Ω		
V 8	6AL5	#160Ω	110KΩ	.1Ω	0Ω	68Ω	0Ω	#4KΩ		
V 9	6AQ5	#4KΩ	#1.1KΩ	0Ω	.1Ω	†18KΩ	0Ω	#4KΩ		
V 10	12AU7	†320KΩ	#300KΩ #1.3 Meg.	#1.2KΩ	.1Ω	.1Ω	10KΩ	#750KΩ	#8KΩ	0Ω
V 11	6AU6	47KΩ	68Ω	0Ω	.1Ω	†10KΩ	†10KΩ	68Ω		
V 12	6AU6	47KΩ	0Ω	0Ω	.1Ω	†68KΩ	†1IKΩ	120Ω		
V 13	6AL5	68KΩ	3.2Ω	0Ω	.1Ω	Inf.	0Ω	Inf.		
V 14	6AU6	10 Meg.	0Ω	0Ω	.1Ω	†100KΩ	†1.5 Meg.	0Ω		
V 15	6Y6G	0Ω	0Ω	†740Ω	†6KΩ	470KΩ	Inf.	.1Ω	180Ω	
V 16	12AX7	†220KΩ	70KΩ	#560KΩ	0Ω	0Ω	†33KΩ	13KΩ	#1.2 Meg.	.1Ω
V 17	12AU7	†270KΩ	4.7 Meg.	#60Ω	.1Ω	.1Ω	†22KΩ	†1.5 Meg.	0Ω	0Ω
V 18	6AQ5	#1 Meg. #2 Meg.	#1000Ω #6KΩ	0Ω	.1Ω	†1.8KΩ	†1.8KΩ	#1 Meg. #2 Meg.		
V 19	6AL5	0Ω	1.1 Meg.	2Ω	.1Ω	200KΩ	0Ω	1.1 Meg.		
V 20	6AU6	1.2 Meg.	0Ω	0Ω	.1Ω	†2.2KΩ	†2.2KΩ	0Ω		
V 21	12AU7	†120Ω †170Ω	100KΩ	10Ω	0Ω	0Ω	†39KΩ †280KΩ	#500KΩ	#27KΩ	.1Ω
V 22	6BQ6GT	Inf.	0Ω	†10KΩ †12KΩ	†10KΩ †12KΩ	#820KΩ	Inf.	.1Ω	#300Ω	TOP CAP †2.2KΩ
V 23	6W4GT	0Ω	Inf.	†2.2KΩ	Inf.	0Ω	†30Ω	Inf.	Inf.	
V 24	6Y6GT	Inf.	0Ω	†70Ω	†66KΩ	#470KΩ	#470KΩ	.1Ω	#280Ω	
V 25	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †60Ω
V 26	7X6	.1Ω	14KΩ	200Ω	4.5Ω	4.5Ω	200Ω	14KΩ	0Ω	
V 27	5U4G	Inf.	14KΩ	Inf.	7Ω	Inf.	7Ω	Inf.	14KΩ	
V 28	12VP4	0Ω	1 Meg.	PIN 11 3.3KΩ	PIN 12 .1Ω					

† MEASURED FROM PIN 8 OF V27.
# MEASURED FROM JUNCTION OF M1 and M2.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.

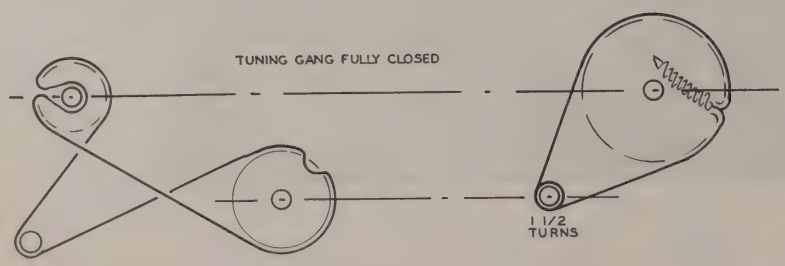


CHASSIS-TOP VIEW

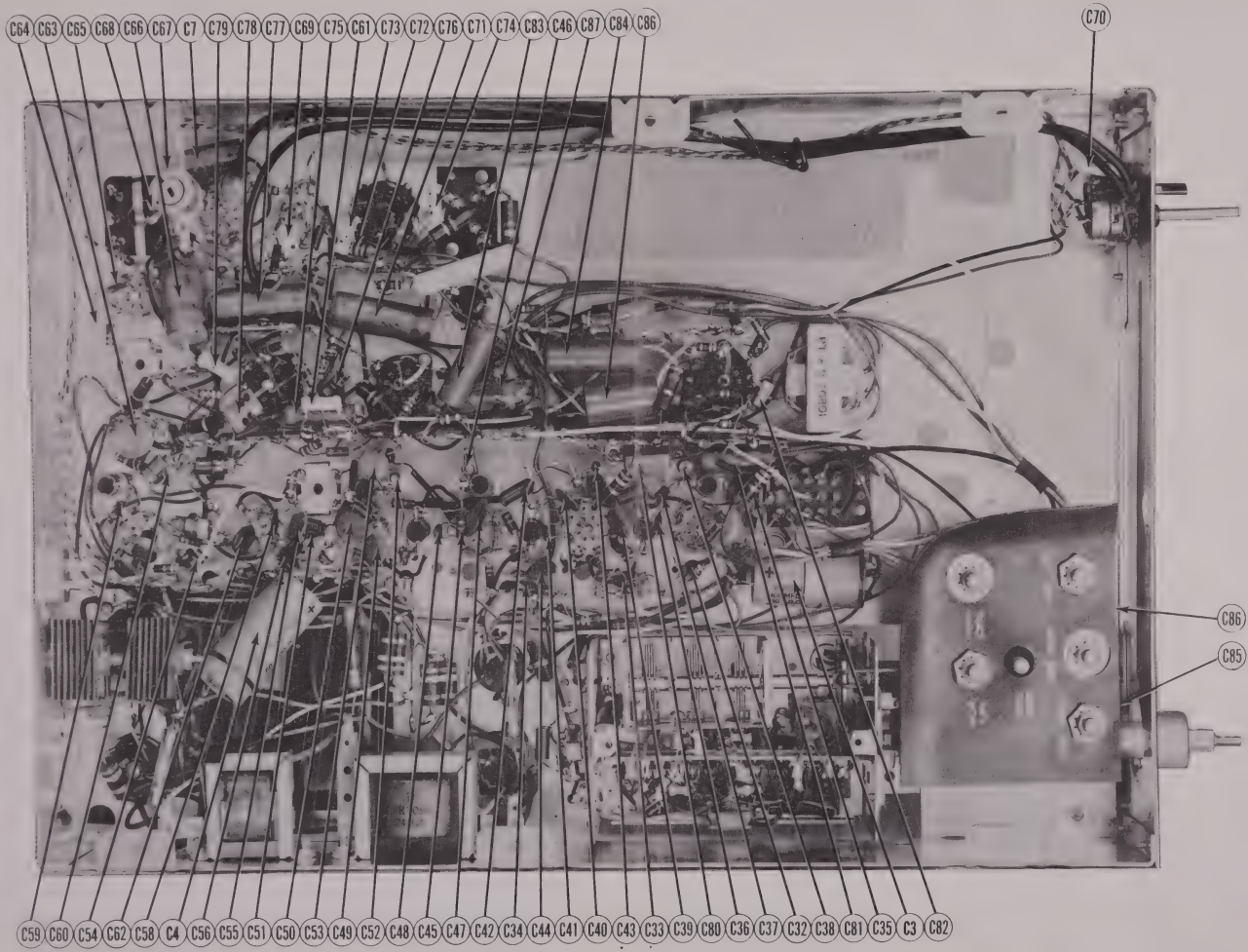
DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs.
2. Remove six wood screws holding rear cover in place.
3. Remove rear cover.
4. Disconnect built-in antenna.
5. Disconnect speaker from chassis.
6. Remove six 5/16" hex head bolts holding chassis in cabinet. Remove chassis.

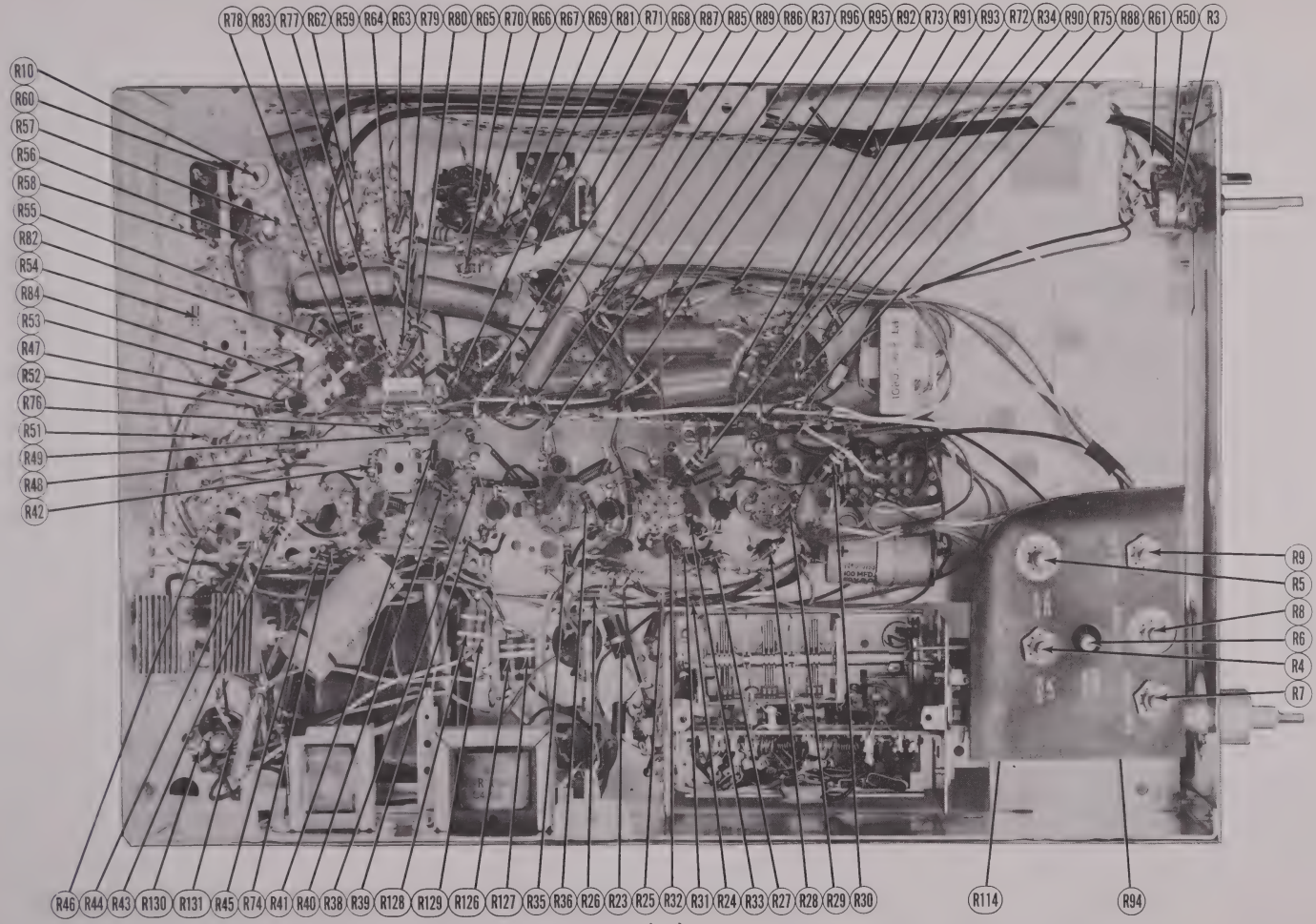
NOTE: FOR PICTURE TUBE REMOVAL FOLLOW INSTRUCTIONS ABOVE.



DIAL CORD STRINGING



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1A	1st RF Amp.	632-0011	6BC5	7BD	
B	1st RF Amp.	623-0001	6AG5	7BD	
V2A	2nd RF Amp.	632-0011	6BC5	7BD	
B	2nd RF Amp.	623-0001	6AG5	7BD	
V3	Converter	623-0001	6J6	7BF	
V4	1st Video IF	623-0004	6BA6	7BK	
V5	2nd Video IF	623-0004	6BA6	7BK	
V6	3rd Video IF	623-0005	6AU6	7BK	
V7	4th Video IF	623-0001	6AG5	7BD	
V8	Video Det. -AGC Clamp.	623-0003	6AL5	6BT	
V9	Video Amp.	623-0007	6AQ5	7BZ	
V10	AGC Amp. -Vert. Osc.	623-0006	12AU7	9A	
V11	Sound IF Amp.	623-0005	6AU6	7BK	
V12	Limiter	623-0005	6AU6	7BK	
V13	Ratio Det.	623-0003	6AL5	6BT	
V14	AF Amp.	623-0003	6AU6	7BK	
V15	Audio Output	622-0006	6Y6G	6AC	
V16	Sync. Sep.	623-0008	12AX7	9A	
V17	Sync. Clipper	623-0006	12AU7	9A	
V18	Vert. Amp.	623-0007	6AQ5	7BZ	
V19	Hor. Discr.	623-0003	6AL5	6BT	
V20	Hor. AFC	623-0005	6AU6	7BK	
V21	Hor. Osc. -Disch.	623-0006	12AU7	9A	
V22A	Hor. Output	622-0008	6BQ6GT	6AM	Used in bridge chassis B18 and up.
B	Hor. Output		6BD5GT	6CK	Used in bridge chassis B15 thru B17.
V23	Damper	622-0004	6W4GT	4CG	
V24	HV Osc.	622-0006	6Y6G	7AC	
V25	HV Rect.	633-0002	1B3GT	3C	
V26	LV Rect.	633-0008	7X6	7AJ	
V27	LV Rect.	633-0003	5U4G	5T	
V28A	Picture Tube	12VP4	12VP4	12G	
B	Picture Tube	642-0001	10MP4	12G	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	80	250	161-4001	AF10128F4D		UPT86425-215		TVL-4524	▲ Filter
B	60	250							■ Decoupling
C	40	250							▲ Filter
D	20	150							Output Screen
C2A	40	250	161-2001	AF88F		UP40025C			■ Filter
B	25	25							▲ Output Cath.
C3	100	50	161-1002	PRS50/100		BRH501		TVA-1310	Hor. Cent. Cont. Byp.
C4	60	200	161-1003	PRS250/40 PRS250/20		BR6035			Filter
C5A	10	450	161-4000	AF2J2G12E		UPT411		TVL-4705	▲ Vert. Output Dec.
B	10	300		20B					■ Vert. Osc. Dec.
C	60	200							▲ Filter
D	100	50							Vert. Output Cath.
C6	10	12	161-1004	PRS25/10		BR102A		TVA-1204	AGC Filter
C7	2	50	161-1001	PRS150/4		BBR2-50		TVA-1301	Stabilizing Cap.
C8	10	25	161-1000	PRS25/10		BR102A		TVA91204	Hor. Output Cath. ¶
C9	20	250	161-1005	PRS250/20		BR2025		TVA-1508	Hor. AFC Dec.
C10	47			SI47N750	TCN-47		N750L-47	19C9	RF Coupling
C11	1500			SI1500	D6-152		GP2L-0015	19C20	AGC Filter
C12	5000			BPD-005	DD-502		811-005	29C1	1st RF Decoupling
C13	5000			BPD-005	DD-502		811-005	29C1	1st RF Decoupling
C14	14						NPOK-14		Fixed Padder
C15	100			SI100	D6-101		GP1K-100	19C11	RF Coupling
C16	4.7			SI4.7NPO	TCZ-4.7		NPOK-4.7		RF Coupling
C17	5000			BPD-005	DD-502		811-005	29C1	1st RF Fil. Byp.
C18	680			SI680	D6-681		GP2K-680	19C17	2nd RF Cath.
C19	5000			BPD-005	DD-502		811-005	29C1	2nd RF Decoupling
C20	5000			BPD-005	DD-502		811-005	29C1	2nd RF Decoupling
C21	14						NPOK-14		Fixed Padder
C22	100			SI100	D6-101		GP1K-100	19C11	RF Coupling
C23	5000			BPD-005	DD-502		811-005	29C1	2nd RF Fil.
C24	2.2				TCZ-2.2				Osc. Coupling
C25	33			SI33	D6-330		GP1K-33	19C24	Osc. Grid Cap.
C26	19						NPOK-19		Fixed Padder
C27	17.5						N47OK-17.5		Fixed Trimmer
C28	10			SI10N750	TCN-10		N750K-10	19C4	Fixed Trimmer
C29	10			SI10N750	TCN-10		N750K-10	19C4	Fixed Trimmer
C30	5000			BPD-005	DD-502		811-005	29C1	RF Bypass
C31	100			SI100	D6-101		GP1K-100	19C11	IF Coupling
C32	5000		166-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C33	5000		166-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C34	5000		166-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C35	5000		166-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	1st Video IF Decoup.
C36	1000		166-1000D	BPD-001	DD-102	1W5D1	811-001	19C1	1st Video IF Fil.
C37	1.5		168-0001P	SI1.5NPO	TCZ-1.5		NPOK-1.5		IF Coupling *
C38	10		166-0010P	SI10NPO	TCZ-10	5R5Q1	NPOK-10	19C3	Fixed Trimmer
C39	5000		166-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C40	5000		166-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	2nd Video IF Decoup.
C41	1000		166-1000D	BPD-001	DD-102	1W5D1	811-001	19C1	2nd Video IF Fil.
C42	1.5		168-0001P	SI1.5NPO	TCZ-1.5		NPOK-1.5		IF Coupling
C43	4.7		168-0008N	SI4.7NPO	TCZ-4.7		NPOK-4.7		Fixed Trimmer †
C44	5000		166-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	Bias Filter
C45	.68		168-0004P		TCZ-.68				IF Coupling
C46	10		166-0010P	SI10NPO	TCZ-10	5R5Q1	NPOK-10	19C3	Fixed Trimmer ‡
C47A	4000		168-0003D	BPD-2 x 004	DD-2-502	1D5D4	882-2 x 004	36C2	3rd Video IF Decoup.
B	4000		168-0003D			1D5D4			3rd Video IF Cath.
C48	1000		166-1000D	BPD-001	DD-102	1W5D1	811-001	19C1	3rd Video IF Fil.
C49	5000		166-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	4th Video IF Decoup.
C50	5000		166-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	4th Video IF Cath. §
C51	1000		166-1000D	BPD-001	DD-102	1W5D1	811-001	19C1	4th Video IF Fil.

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SYLVANIA Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	SPRAGUE Part No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C52	50		168-0009M	SI50NPO	TCZ-50	5R5Q5	NPOM-50	39C14	Fixed Trimmer *
C53	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	39C1	RF Bypass
C54	10		168-0010P	SI10	D6-100	5W5Q4	GPIK-10	19C10	Video Diode Filter
C55	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	39C1	RF Bypass
C56	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	39C1	RF Bypass
C57	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	39C1	RF Bypass
C58	5000		168-5000D	BPD-005	DD-502	1D5D6	811-005	39C1	Video Det. -AGC Clamp.
C59	4.7		168-0008N	SI4.7NPO	TCZ-4.7		NPOK-4.7		Sound IF Coupling
C60	10		168-0010P	SI10NPO	TCZ-10	5R5Q4	NPOK-10	19C3	Fixed Trimmer
C61	10000		168-0003M	SI10000	D6-103	PTE8S1	811-01	36C1	Pic. Tube Grid
C62	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	AGC Filter
C63A	4000		168-0003D	BPD-3 x 004	DD-2-502	1D5D4	811-005	36C2	1st Sound IF Dec.
B	4000		168-0003D			1D5D4	882-2 x 004		1st Sound IF Cath.
C64	50		168-0050N	SI50	D6-500	5W5Q5	GPIK-50	19C28	2nd Sound IF Grid Filter
C65	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	2nd Sound IF Screen
C66	.3	400	162-0042	P488-32		GT4P2		4TM-324	2nd Sound IF Plate Dec.
C67	680	500	163-0680	SI680	D6-681	1W5T7	GP2K-680	19C17	De-emphasis
C68	10000		168-0003M	SI10000	D6-103	PTE8S1	811-01	36C1	Audio Coupling
C69	10000		168-0003M	SI10000	D6-103	PTE8S1	811-01	36C1	Audio Coupling
C70	10000		Note 3	SI10000	D6-103	PTE8S1	811-01	36C1	Tone Comp.
C71	.1	200	163-0601	P388-1	DF-104	PTK4P1		2TM-1	AF Amp. Screen
C72	100		168-0100P	SI100	D6-101	5W5T1	GPIK-100	19C11	AF Amp. Plate
C73	10000		168-0003M	SI10000	D6-103	PTE8S1	811-01	36C1	Audio Coupling
C74	10000		168-0003M	SI10000	D6-103	PTE8S1	811-01	36C1	Output Plate
C75	.003	600	162-0633	P688-003	D6-302	PTE8D3	GP2M-003	6TM-23	Hor. Sync. Sep. Cath.
C76	500		168-0500P	SI500	D6-501	5W5T5	GP2K-500	19C32	Hor. Sync. Coupling
C77	.1	300	163-0601	P388-1	DF-104	PTK4P1		2TM-1	Vert. Sync. Sep. Cath.
C78	500	500	163-0500	P488-005	DF-501	5W5T5	GP2K-500	1FM-35	Vert. Sync. Sep. Plate
C79	10000		168-0003M	SI10000	D6-103	PTE8S1	811-01	36C1	Vert. Sync. Coupling
C80	1000	500	163-1000	1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Vert. Sync. Coupling
C81	.015	400	162-0415	P488-015		PTE8S15		6TM-153	Vert. Osc. Grid
C82	250		168-0250P	SI250	D6-351	5W5T25	GP2K-250	1FM-325	Vert. Osc. Grid
C83	.05	200	163-0605	P388-05	DF-503	PTE4S3		2TM-15	Vert. Osc. Cath.
C84	.1	300	163-0601	P388-1	DF-104	PTK4P1		2TM-1	Vert. Discharge
C85	.1	200	163-0601	P388-1	DF-104	PTK4P1		2TM-1	Vert. Sweep Coupling
C86	.03	400	162-0623	P488-03	DF-303	PTE4S3		6TM-13	Voltage Divider
C87	25	1000		1469-HV-00025					Vert. Sweep Feedback-See Note 1
C88	100	500	166-0100P	1468-001	D6-101	5W5T1	GPIK-100	1FM-35	Hor. Sync. Coupling
C89	.005	400	162-0625	P688-005	D6-502	PTE6D5	811-005	6TM-25	Fixed Trimmer
C90	10000		168-0003M	SI10000	D6-103	PTE8S1	811-01	36C1	AFC Filter
C91	.3	400	162-0042	P488-32		GT4P2		4TM-324	AFC Filter
C92	.015	400	180-42115	P488-015		PTE8S15		6TM-153	Fixed Trimmer
C93	100	500	168-0100P	1468-008	D6-101	5W5T1	GPIK-100	1FM-31	Phase Shifter
C94	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	Hor. Osc. Grid
C95	.01	600	168-0002M	P688-01	D6-103	PTE6S1	811-01	6TM-11	Hor. Sweep Coupling
C96	10000		168-0003M	SI10000	D6-103	PTE6S1	811-01	36C1	Hor. Disch. Cath.
C97	680	500	163-0680	SI680	D6-681	1W5T7	GP2K-680	19C17	Hor. Discharge
C98	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	Hor. Discharge
C99	1000		168-1000P	SI1000	D6-102	1W5D1	GP2L-001	19C1	Hor. Sweep Coupling
C100	.05	400	162-0615	P488-05	DF-503	PTE4S3		4TM-15	Hor. Output Screen ¶
C101	.1	800	162-0618	P688-1	DF-104	PTF6P1		6TM-1	Hor. Sweep Coupling
C102	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	HV Osc. Screen
C103	.047	400	163-0447	P488-047	DF-503	PTE4S3		4TM-473	HV Osc. Cath.
C104	.022	400	180-42133	P488-022	DF-203	PTE4S3		4TM-223	RF Bypass
C105	680	500	163-0680		D6-681	1W5T7	GP2K-680	19C17	Fixed Trimmer
C106	5000		168-5000D	BPD-005	DD-502	1D5D5	811-005	29C1	HV Osc. Grid
C107	.0005	10000	180-16350	P8088-0005		PTE70T5		7TM-356	HV Filter
C108	.05	400	162-0615	P488-05	DF-503	PTE4S3		4TM-15	HV Osc. Decoup.

* Chassis code C15 to C17 incl. use .68MMF in this application.
† Chassis code C15 to C17 incl. use 10MMF in this application.
‡ Chassis code C15 to C17 incl. use 6 MMF in this application.
§ Chassis code C15 to C17 incl. use .0044D in this application.
● Not used in chassis codes C15 to C17 inclusive.
¶ Not used in bridge codes B15 to B17 inclusive.
Note 1. Used only on chassis codes C22 and higher.
Note 2. Items C70 and R61 are combined into one unit, obtainable under Mfg'rs part #190-0002.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA Part No.	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	INSTALLATION NOTES
R1A	100K†	½	193-3005	Q11-128	AG-49-S	B-40	Brightness control
B	Shaft:		Not Req.	NQ	RS-3/16 *	Not Req.	Attach to R1A per instructions
R2	10kΩ	2	193-3003	W-10000	43-1kΩ	V-129	Contrast control-Wire Wound
R3A	Mer.	½	152-0007	Q13-137A	AK-58		Volume control tapped at 2.0KΩ
B	Shaft		Not Req.	NQ	RS-3/16 *		Attach to R3A per instructions
C	Switch		Not Req.	76-1	SWB		Attach to R3A per instructions
R4A	500K‡	½	153-3002	Q11-133	AG-58-S	B-59	Horiz. linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R4A per instructions
R5	140Ω	2	153-3002		43-150	VK-121	Horiz. centering control-Wire Wound
R6	2000Ω	4	153-3004			SVP-998	Horiz. size control-Wire Wound
R7A	1 Meg.	½	152-0007	Q11-137	AG-61-S	B-69	Vert. hold control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req	Attach to R7A per instructions
R8A	1 Meg.	½	153-0007	Q11-137	AG-61-S	B-69	Vert. size control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req	Attach to R8A per instructions
R9	5000Ω	2	153-3000	W-5000	43-5000	VK-135	Vert. linearity control-Wire Wound
R10	3900Ω		153-0007				AGC control-Wire Wound

* File flat on shaft to fit knob.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA Part No.	IRC Part No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R11	150Ω 20%	½	181-0151	BTS-150	AGC Network
R12	560Ω	½	181-0561	BTS-560	1st RF Grid
R13	1000Ω 20%	½	181-0102	BTS-1000	1st RF Decoupling
R14	1200Ω	½	181-0123	BTS-1200	1st RF Coil Shunt
R15	10kΩ	½	181-0103		2nd RF Grid
R16	100Ω 20%	½	181-0101	BTS-100	2nd RF Cathode

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA Part No.	IRC Part No.	IDENTIFICATION CODES
R17	220Ω 20%	½	181-0221	BTS-220	Decoupling
R18	1500Ω	½	181-0152	BTS-1500	2nd RF Coil Shunt
R19	5600Ω	½	181-0562	BTS-5600	Mixer Grid
R20	100kΩ 20%	½	181-0104		Mixer Grid
R21	10kΩ	½	181-0103		Mixer Plate Load
R22	10kΩ	½	181-0103		Osc. Grid
R23	1000Ω	2	183-0102	BTB-1000	Decoupling
R24	6.8 Meg.	½	181-0685	BTS-6.8 Meg.	Voltage Divider
R25	100kΩ	½	181-0104	BTS-100K	AGC Network
R26	1000Ω 20%	½	181-0102	BTS-1000	AGC Network
R27	10000Ω 20%	½	181-0102	BTS-1000	AGC Network
R28	1500Ω	½	181-0152	BTS-1500	1st Video IF Amp. Grid
R29	82Ω	½	181-0820	BTS-82	1st Video IF Amp. Cathode
R30	3900Ω	½	182-0392	BTA-3900	1st Video IF Amp. Decoupling
R31	10000Ω 20%	½	181-0102	BTS-1000	AGC Network
R32	2700Ω	½	181-0272	BTS-2700	2nd Video IF Coil Shunt
R33	820Ω	½	181-0820	BTS-820	2nd Video IF Amp. Cathode
R34	3900Ω	½	182-0392	BTA-3900	2nd Video IF Amp. Decoupling
R35	12kΩ	½	181-0123		3rd Video IF Coil Shunt
R36	2300Ω 5%	½	181-0232	BTS-3300-5%	3rd Video IF Amp. Cathode
R37	47kΩ	½	181-0473	BTS-47K	Trap Coil Shunt
R38	1000Ω 20%	½	181-0102	BTS-100	3rd Video IF Amp. Decoupling
R39	33kΩ	½	181-0333		4th Video IF Coil Shunt
R40	150Ω 5%	½	181-0151	BTS-150-5%	4th Video IF Amp. Cathode
R41	1000 20%	½	181-0101	BTS-100	4th Video IF Amp. Decoupling
R42	4700Ω	½	181-0472	BTS-4700	5th Video IF Coil Shunt
R43	22kΩ 5%	½	181-0223		Peaking Coil Shunt
R44	3900Ω 5%	½	181-03925	BTS-3900-5%	Video Det. Diode Load
R45	100Ω 20%	½	181-0101	BTS-100	Decoupling
R46	680Ω	½	181-0680	BW-J-68	Video Amp. Cathode
R47	100kΩ 20%	½	182-0104	BTA-100K	Video Amp. Plate Load
R48	3300Ω	2	183-0332	BTB-3300	Picture Tube Cathode
R49	1 Meg. 20%	½	181-0105	BTS-1 Meg.	Voltage Divider
R50	27kΩ	½	181-0273	BTS-27K	Voltage Divider
R51	47kΩ 20%	½	181-0473		1st Sound IF Amp. Grid
R52	680Ω 20%	½	181-0680		1st Sound IF Amp. Cathode
R53	10kΩ 20%	½	182-0103		1st Sound IF Amp. Decoupling
R54	47kΩ 20%	½	181-0473	Sweep Feedback-See Note 1	Limiter Grid
R55	120Ω	½	181-0121	BTS-120	Limiter Cathode
R56	15kΩ	½	182-0153		Limiter Decoupling
R57	68kΩ	½	181-0683		Limiter Plate Decoupling
R58	33kΩ 20%	½	181-0333		Voltage Divider
R59	68kΩ	½	181-0683		Ratio Detector Diode Load
R60	100kΩ 20%	½	181-0104	BTS-100K	De-emphasis
R61	82kΩ	½	181-0823	BTS-82K	Tone Compensation-See Note 1
R62	10 Meg. 20%	½	181-0106	BTS-10 Meg.	AF Amp. Grid
R63	1.5 Meg. 20%	½	181-0155	BTS-1.5 Meg.	AF Amp. Screen
R64	150kΩ 20%	½	181-0154	BTS-150K	AF Amp. Plate Load
R65	470kΩ 20%	½	181-0474	BTS-470K	Output Grid
R66	180Ω	½	182-0181	BTA-180	Output Cathode
R67	680Ω	½	181-0680		Parasitic Suppressor
R68	5600Ω	2	183-0562	BTB-5600	Voltage Divider
R69	820Ω	½	182-0223	BTA-820	Vert. Sync. Clipper Grid
R70	4700Ω	½	181-0472	BTS-4700	Voltage Divider
R71	4000	3	187-0001	1 3/4A-400	Decoupling-Wire Wound
R72	82000Ω 5%	½	182-08225	BTA-8200-5%	AGC Amp. Cathode
R73	4700Ω 5%	½	182-04725	BTA-4700-5%	AGC Amp. Cathode-See Note 2
R74	68Ω	½	181-0680	BW-J-68	AGC Amp. Cathode
R75	10kΩ	½	181-0103	BTS-10K	Voltage Divider
R76	470kΩ 5%	½	181-04745	BTS-470K	1st Sync. Sep. Cathode-See Note 2
R77	750kΩ 5%	½	181-07545		Bias Network-See Notes 2 and 3
R78	10kΩ 20%	½	181-0103	BTS-10K	Isolation
R79	33kΩ	½	181-0333	BTS-33K	1st Sync. Sep. Plate Load
R80	1.5 Meg.	½	181-0155	BTS-1.5 Meg.	Hor. Sync. Clipper Grid
R81	22kΩ	½	182-0223	BTA-22K	Hor. Sync. Clipper Plate Load
R82	68kΩ	½	181-0683	BTS-68K	Isolation
R83	360kΩ	½	181-0364	BTS-360K	2nd Sync. Sep. Cathode
R84	220kΩ	½	181-0224	BTS-220K	2nd Sync. Sep. Plate Load
R85	820kΩ	½	181-0824	BTS-820K	Vert. Sync. Clipper Grid
R86	3.9 Meg.	½	181-0395	BTS-3.9 Meg.	Vert. Sync. Clipper Grid
R87	270kΩ	½	181-0274	BTS-270K	Vert. Sync. Clipper Plate Load
R88	270kΩ 5%	½	181-0274	BTS-270K-5%	Vert. Osc. Grid
R89	1200Ω	½	181-0122	BTS-1200	Decoupling
R90	22kΩ 5%	½	181-0223	BTS-22K-5%	Vert. Osc. Transformer Shunt
R91	220kΩ 20%	½	181-0224	BTS-220K	Vert. Osc. Plate Load
R92	100kΩ 20%	½	181-0104	BTS-100K	Vert. Osc. Decoupling
R93	47000Ω 5%	½	181-04725	BTS-47000-5%	Vert. Peaking
R94	1 Meg.	½	181-0105	BTS-1 Meg.	Vert. Output Grid
R95	10000Ω 20%	½	181-0102	BTS-1000	Vert. Output Decoupling
R96	1000Ω	½	181-0102	BTS-1000	Vert. Output Decoupling
R97	100kΩ	½	181-0104	BTS-100K	Hor. Sync. Disc. Diode Load
R98	100kΩ	½	181-0104	BTS-100K	Hor. Sync. Disc. Diode Load
R99	1 Meg. 20%	½	181-0105	BTS-1 Meg.	Hor. Sync. Disc. Diode Load
R100	1 Meg. 5%	½	181-01055	BTS-1 Meg. 5%	Hor. AFC Filter Network
R101	33kΩ 5%	½	181-03335	BTS-33K-5%	Voltage Divider
R102	100kΩ 5%	½	181-01045	BTS-100K-5%	Voltage Divider
R103	10 Meg. 5%	½	189-0010	BTS-10 Meg. 5%	Voltage Divider
R104	4.3Ω 5%	½	189-0007		Hor. Sync. Disc. Filament-Wire Wound
R105	8200Ω	½	181-0822	BTS-8200	Hor. Control Tube Grid
R106	1000Ω 20%	½	181-0102	BTS-1000	Hor. Control Tube Grid
R107	2200Ω	½	181-0222	BTS-2200	Hor. Control Tube Decoupling
R108	100kΩ 20%	½	181-0104	BTS-100K	Hor. Osc. Grid
R109	22kΩ 20%	½	181-0223	BTS-22K	Hor. Osc. Coil Shunt
R110	470kΩ	½	181-0474	BTS-470K	Hor. Discharge Grid
R111	27kΩ	½	181-0273	BTS-27K	Hor. Discharge Cathode-See Note 4
R112	39kΩ	½	181-0393	BTS-39K	Hor. Discharge Plate Load
R113	4700Ω	½	181-0472	BTS-4700	Hor. Peaking
R114	390kΩ	½	181-0394	BTS-390K	Hor. Linearity Control Shunt
R115	1000Ω 20%	½	181-0101		Parasitic Suppressor-See Note 5
R116	820kΩ	½	181-0824	BTS-820K	Hor. Output Grid-See Note 6
R117	470Ω	2	183-0471	BTB-470	Hor. Output Cathode-See Note 5
R118	470Ω	2	183-0471	BTB-470	Hor. Output Cathode-See Note 5
R119	10kΩ	2	183-0103	BTB10K *	Hor. Output Screen-See Note 5
R120	470kΩ 20%	½	181-0474	BTS-470K	HV Osc. Grid
R121	2200 20%	2	183-0221		HV Osc. Cathode

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SYLVANIA Part No.	IRC Part No.	IDENTIFICATION CODES
R122	56kΩ	2	183-0563	BTB-56K	HV Osc. Screen
R123	1000 20%	½	181-0101		Parasitic Suppressor
R124	3.6Ω	2			HV Rect. Filament-Wire Wound
R125	470kΩ 20%	½	181-0474		HV Filter
R126	39Ω	2	182-0391		Rectifier Ballast
R127	39Ω	2	182-0391		Rectifier Ballast
R128	39Ω	2	183-0391		Rectifier Ballast
R129	39Ω	2	183-0391		Rectifier Ballast
R130	39Ω	2	183-0390		Rectifier Ballast
R131	39Ω	2	183-0390		Rectifier Ballast
R132	1000Ω	½	181-0102	BTS-1000	Voltage Divider-See Note 2
R133	100Ω	½	181-0101		Parasitic Suppressor-See Note 2

Note 1. Items R61 and C70 are combined into one unit obtainable under Mfgr's part #190-0002.
Note 2. Not used in chassis codes C15 and C16.
Note 3. Some models use 680kΩ resistor in this application.
Note 4. Bridge codes before B18 used 56kΩ in this application.
Note 5. Not used in bridge codes before B18.
Note 6. Bridge codes before B18 use 10 Meg. in this application.

TRANSFORMER (POWER)

ITEM No.	RATING	REPLACEMENT DATA SYLVANIA Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.
T1A	PRI. 117VAC ⓐ 2.25A; SEC. 1 440VCT ⓐ .330ADC; SEC. 2 5VAC ⓐ 3A; SEC. 3 6.3VAC ⓐ 11.2A	141-0008			
B	Tap 50 260VCT ⓐ .200 ADC	141-0009 ①			

① Alternate for T1A.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA SYLVANIA Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.
T2	6.3VAC ⓐ 1.66A	6.3VAC ⓐ 1.2A			240-0001			F-633 ④

④ Drill one new mounting hole.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	SEC.	REPLACEMENT DATA SYLVANIA Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	NOTES
T3	170Ω	575Ω	242-0001	A-8111	A-3000	TBO-1	Vert. Block Osc. Trans.
T4	170Ω	1300 CT	②				Hor. Output Choke
T4	160Ω	1200	241-0002 ②				Hor. Output Choke
T5	620Ω	Tap ⑤ 6.1Ω	241-0001	A-8123 ④	A-3037	TSO-5	Vert. Output Trans.
T6A	39Ω		②				Hor. Deflection Coil
B	60Ω						Vert. Deflection Coil
T6A	36Ω		100-0001 ②				Hor. Deflection Coil
B	60Ω						Vert. Deflection Coil
T7	1.5Ω	570Ω	113-0010				HV Trans.
		SEC. 2 .6Ω					
		SEC. 3 .9Ω					

② Used in some models.
④ Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SYLVANIA Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	INSTALLATION NOTES
T8	26000Ω	3.5Ω	250Ω	.5Ω	143-0009	A-3849	A-2902	RO-305	

SPEAKER

ITEM No.	RATINGS FIELD RES.	V. C. IMP.	REPLACEMENT DATA SYLVANIA Part No.	JENSEN Part No.	QUAM Part No.	NOTES
SP1	PM	3.5Ω	539-0500	ST-803 MOD. P525-V	52A1 ③	③ Remount output transformer.
SP2	CONE DIA. 5"	V. C. DIA. 3/4"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 ~Cy	REPLACEMENT DATA SYLVANIA Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	INSTALLATION NOTES
L1	.330ADC	22.5Ω	.6 Henries	145-0001				
L2	.220ADC	60Ω	1.1 Henries	145-0002				

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

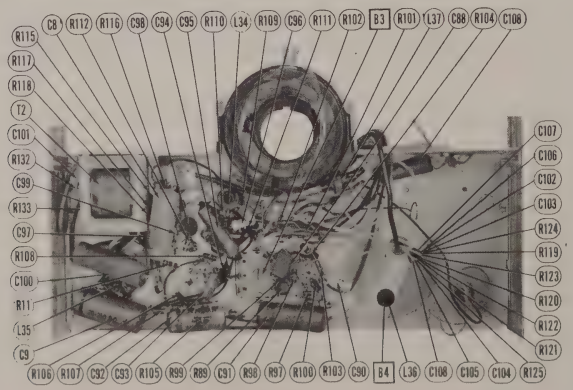
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SYLVANIA PART No.	MEISSNER PART No.	
L3	Ant. Trans.	.1Ω	.1Ω	*		Low Band *Part of tuner #323-0001
L4	Ant. Trans.	0Ω	0Ω	*		High Band
L5	RF Coil	0Ω		*		Low Band
L6	RF Coil	0Ω		*		High Band
L7	RF Coil	0Ω		*		Low Band
L8	RF Coil	0Ω		*		High Band
L9	Osc. Coil	0Ω		*		Low Band
L10	Osc. Coil	0Ω		*		High Band
L11	Fil. Choke	0Ω		*		
L12	1st Video IF	.9Ω		*		
L13	Fil. Choke	0Ω		147-0014		
L14	IF Trap	.3Ω		118-0003		
L15	Fil. Choke	0Ω		147-0014		
L16	2nd Video IF	.7Ω	.7Ω	125-0001		
L17	IF Trap	.3Ω		118-0003		
L18	Fil. Choke	0Ω		147-0014		
L19	3rd Video IF	.7Ω	.7Ω	125-0001		
L20	IF Trap	.3Ω		118-0003		
L21	Fil. Choke	0Ω		147-0014		
L22	4th Video IF	.7Ω	.7Ω	125-0001		
L23	IF Trap	0Ω	0Ω	118-0005		Not used before chassis code C18
L24	Fil. Choke	0Ω		147-0014		
L25	5th Video IF	.5Ω	1.1Ω	120-0002		
L26	Peaking	5Ω		146-0001		Yellow dot
L27	Peaking	8Ω		146-0002		Black dot
L28	Peaking	5Ω		146-0001		Yellow dot, not used before chassis code C18
L29	Peaking	8.5Ω		146-0004		Orange dot
L30	1st Sound IF	6.2Ω		118-0004		
L31	2nd Sound IF	2.7Ω	2.7Ω	120-0001		
L32	Ratio Det. Trans.	5Ω	3.2Ω	128-0002		
L33	Horiz. Sync. Disc. Trans.	80Ω †	38Ω, 10Ω	128-0001		† Tap at 38Ω
L34	Ringing Coil	38Ω		146-0005		
L35	RF Choke	0Ω		147-0014		
L36	RF Choke	62Ω		146-0006		
L37	RF Choke	62Ω		146-0006		
L38	RF Choke	0Ω		*		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	SYLVANIA PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.200ADC	517-0001	NF-5	5Q1	
M2	.200ADC	517-0001	NF-5	5Q1	

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M3	RF Tuner	323-0001	
M4	Fuse	191-0008	3.2A 125V Type MDL
M5	Fuse	191-0006	20A 32V Type SFE
M6A	Fuse	191-0009	.3A 250V Type GJV
B	Fuse	191-0013	.5A
M7A	Fuse	191-0009	.3A 250V Type GJV
B	Fuse	191-0012	3/8A
C	Fuse	191-0014	.25A
M8	Fuse		.3A 250V Type AGC
M9	Ion Trap	400-0002	
M10	Focus Magnet	400-0001	
	Safety Glass	710-0001	
	Knob	743-0001	Channel selector
	Knob	740-0001	Inner Shaft
	Knob	744-0005	Outer Shaft
	Plug	196-0001	14-Prong with lead assembly (connection to Horiz. chassis)



SWEEP CIRCUIT-SUB-CHASSIS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

HORIZONTAL LINEARITY ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal size control until the picture is of proper width.

Turn the horizontal linearity control fully counter-clockwise, and then clockwise slowly until crowding is observed in the center of the picture. Then carefully turn the control counter-clockwise just enough to remove the crowding. On some sets the crowding may not be observed, in this case turn the control to maximum clockwise and leave it there. CAUTION: Do not operate the set for any length of time with this control incorrectly adjusted. Check the setting of the horizontal linearity control frequently during horizontal oscillator alignment.

HORIZONTAL OSCILLATOR CHECK

Turn the set on and tune in a TV station, preferably a test pattern.

Momentarily remove the signal by turning to another channel and back to the original channel. The picture should fall back into sync.

Turn the set off for about 5 minutes, upon turning the set back on the picture should immediately fall back into sync.

SLIGHT RETOUCH ADJUSTMENT

If the oscillator failed any of the above checks, it may be possible to correct it with a slight retouch adjustment as follows:

Remove the horizontal discriminator tube (V19) from its socket.

Adjust the horizontal frequency slug (B1) until the picture moves slowly back and forth across the screen with the blanking bar vertical.

Replace the horizontal discriminator tube (V19) in its socket. Repeat the horizontal oscillator check, if the oscillator does not synchronize properly, procede with complete horizontal oscillator alignment.

COMPLETE HORIZONTAL OSCILLATOR ALIGNMENT

Turn the horizontal peaking slug (B2) fully out, (counter-clockwise), and short R113.

Remove the horizontal discriminator tube (V19) from its socket.

Adjust B1 until the picture moves slowly back and forth across the screen with the blanking bar vertical. Replace V19 in its socket. Turn the horizontal centering control until the edge of the picture can be seen. Turn the contrast down and brightness up until the normally blanked edge of the raster is visable.

Adjust the horizontal phasing slug (B3) until the blanking bar is approximately 1/8 inch wide.

Remove the short from R113 and readjust the horizontal linearity control as outlined under "HORIZONTAL LINEARITY ADJUSTMENTS". Adjust B2 until 1/8 inch of blanking bar is again visable.

Check the oscillator pull-in range as follows:

Turn B1 until the picture falls out of sync. Slowly turn B1 back toward it original position and carefully note the number of bars present just before the picture falls back into sync. Repeat this check for both directions of rotation. If the number of bars present just before synchronization is less than 3 or more than 4 at either end of the pullin range, repeat the complete horizontal oscillator alignment. After completing this check, perform the slight retouch adjustment above.

Repeat the horizontal oscillator check.

HIGH VOLTAGE OSCILLATOR ADJUSTMENTS

Turn the brightness and contrast controls to minimum (counter-clockwise).

Make sure the high voltage power supply shield is securely in place.

Turn the high voltage oscillator trimmer (B4) to maximum capacity (fully clockwise).

Connect the high voltage multiplier probe of a VTVM to the end of the high voltage lead. Slowly turn B4 counter-clockwise while observing the voltage reading on the VTVM. A peak voltage of approximately 18KV should be reached. Do not turn B4 beyond this point.

Turn B4 clockwise to reduce the voltage to 14KV, this is the proper setting for the trimmer. NOTE: The high voltage power supply will show an output voltage (greatly reduced) even though the 250MA, B+ fuse is blown.

AGC ADJUSTMENT

Turn the receiver on and tune to a channel where no picture is received.

Turn the contrast control to the mid-position of its range. Connect the DC Probe of a VTVM to pin 6 of 12AU7 (V10) and common to chassis. Adjust the AGC control until VTVM reads -1 volt. On some sets this reading will be obtained with the control fully counter-clockwise. If this is the case, turn the contrast control to almost maximum and tune in a strong station, if the reading is less than -2 volts leave the control in that position.

If the reading is more than -2 volts, turn the AGC control slowly clockwise while observing the picture. The picture will get darker and start to fall out of sync. Do not turn beyond this point. Turn the control slowly counter-clockwise until the picture hold sync without flutter and turn slightly beyond.

ION TRAP AND FOCUS MAGNET ADJUSTMENT

The ion trap and focus magnet is interdependent and is necessary to check the adjustment of both magnets at the same time.

Set the contrast almost to minimum and the brightness control to maximum. The ion trap should be in position so there is 1/8 inch between the ion trap and the focus magnet. Slowly rotate the ion trap until a raster or picture is visable on the screen. Reduce the brightness and by twisting and moving the ion trap backwards and forward a small amount, adjust for maximum brightness. The correct position of the ion trap is at the point where it ensures the greatest brightness of the raster before it enlarge or fades out as the brightness control is increased. CAUTION: Do not leave the brightness control in this position as it causes the high voltage supply to overload.

Center the picture vertically by moving the focus magnet up or down. After the raster is positioned correctly, lock it in place by tightening the two hexagon nuts. Adjust the focus screws (B5) and (B6) to obtain the best horizontal and vertical definition. If there are two focus screws, they should be adjusted alternately for minimum focus with both screws having approximately an equal air gap. Follow the same procedure if there is only one focus screw. NOTE: A non-magnetic screw driver must be used to adjust the focus screws.

PHOTOFACT* Folder

TRUETONE MODEL
2D1089A

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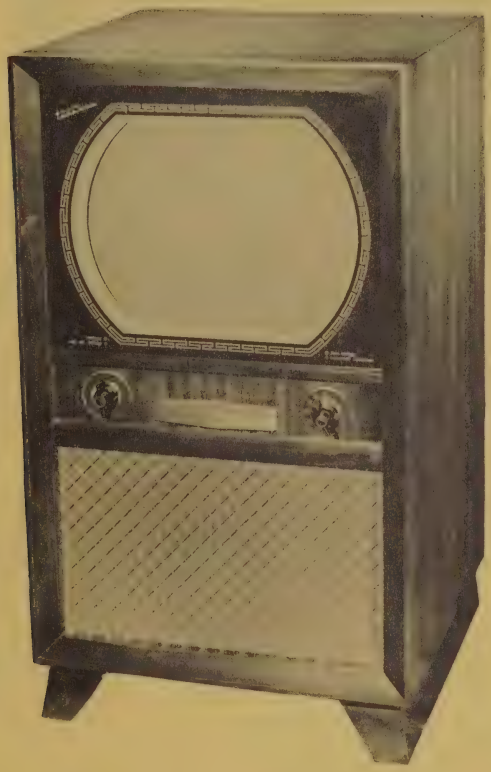

TRUETONE MODEL
2D1089A

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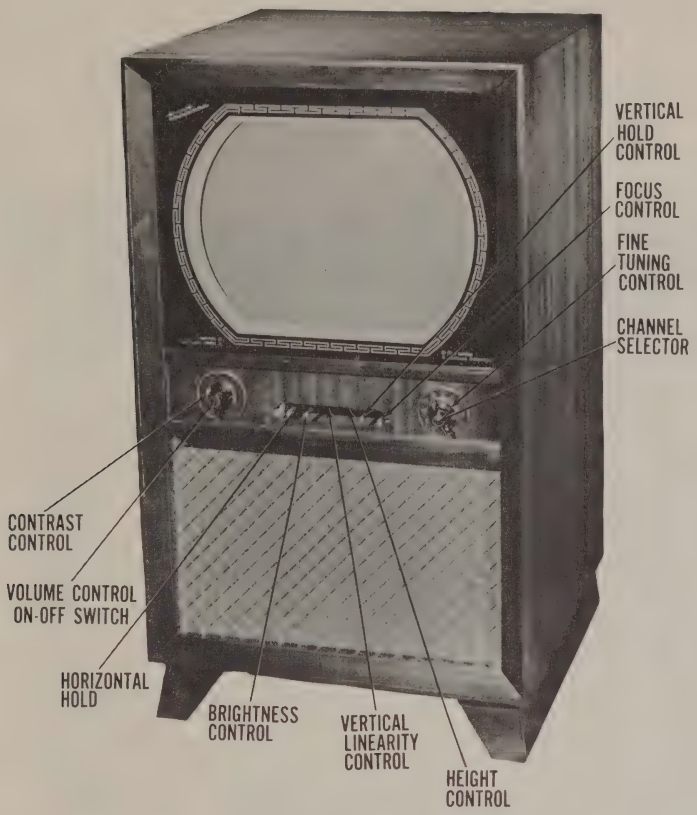

TRUETONE
MODEL 2D1089A

TRADE NAME	Truetone, Model 2D1089A (Factory Model 20T14-956)
SUPPLIER	Western Auto Supply, 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Twenty-Five

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 2.2 Amp. at 117 Volts AC
TUNING RANGE—Channels 2 thru 13

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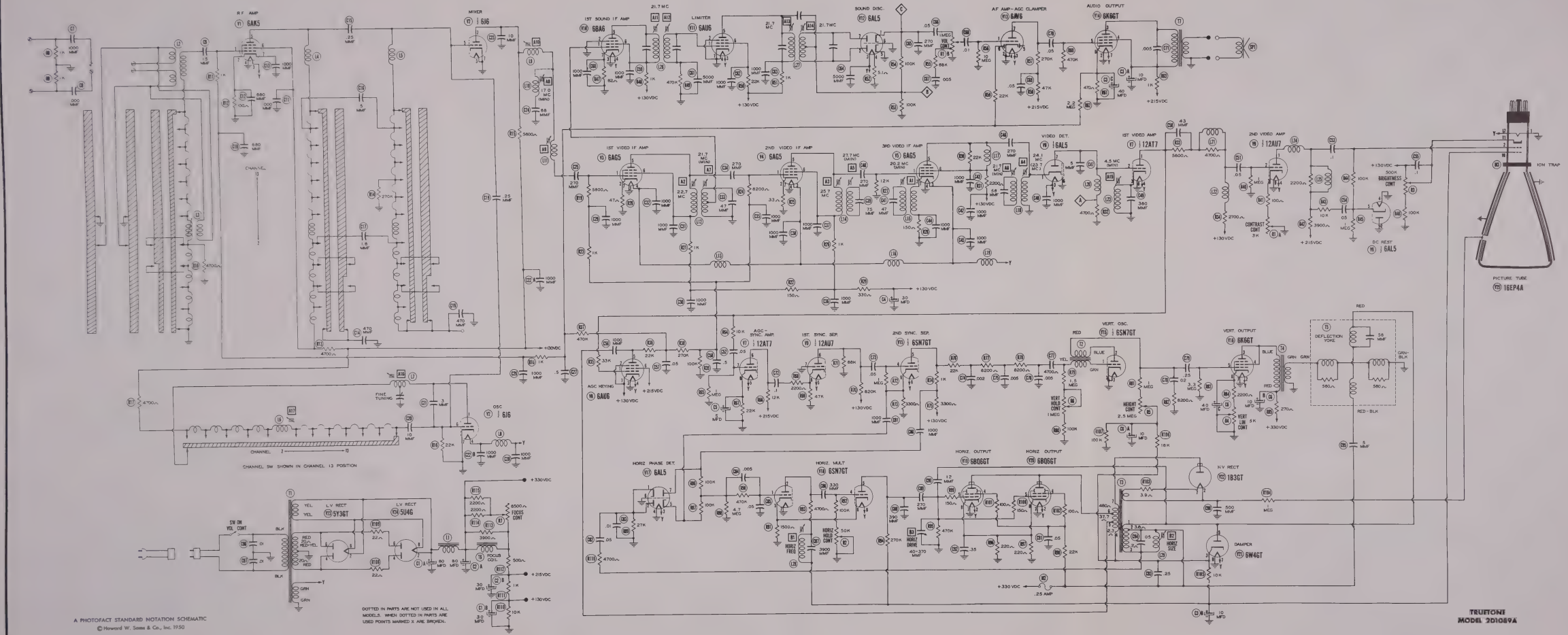
RF AMP
Y1 6AK5
MIXER
Y2 6J6
1ST SOUND IF AMP
Y14 6BA6
21.7 MC
LIMITER
Y11 6AU6
SOUND DISC.
Y12 6AL5
A.F. AMP - AGC CLAMPER
Y12 6AV6
AUDIO OUTPUT
Y14 6K6GT
1ST VIDEO IF AMP
Y3 6AG5
2ND VIDEO IF AMP
Y4 6AG5
3RD VIDEO IF AMP
Y5 6AG5
VIDEO DET.
Y6 6AL5
1ST VIDEO AMP
Y7 12AT7
2ND VIDEO AMP
Y8 12AU7
DC REST.
Y15 6AL5
CONTRAST CONT 3K
BRIGHTNESS CONT
ION TRAP
PICTURE TUBE
Y22 16EP4A
AGC KEYING
Y10 6AU6
AGC - SYNC. AMP.
Y9 12AT7
1ST SYNC. SEP.
Y19 12AU7
2ND SYNC. SEP.
Y15 6SN7GT
VERT. OSC.
Y15 6SN7GT
VERT. OUTPUT
Y16 6K6GT
VERT HOLD CONT 1 MEG
HEIGHT CONT 2.5 MEG
VERT LIN CONT 5 K
DEFLECTION YOKE
RED
BLUE
GRN
RED-BLK
GRN-BLK
HORIZ PHASE DET.
Y17 6AL5
HORIZ. MULT.
Y18 6SN7GT
HORIZ. OUTPUT
Y11 6BQ6GT
HORIZ. OUTPUT
Y20 6BQ6GT
HORIZ HOLD CONT 50K
HORIZ FREQ
HORIZ DRIVE 40-270 MMF
HORIZ SIZE
N.V. RECT.
Y22 1B3GT
DAMPER
Y21 5W4GT
FOCUS COIL
8500Ω FOCUS CONT
FINE TUNING
OSC
Y2 6J6
CHANNEL SW SHOWN IN CHANNEL 13 POSITION
SW ON VOL CONT
L.V. RECT
Y23 5Y3GT
L.V. RECT
Y24 5U4G
+330VDC
+215VDC
+130VDC
+30VDC
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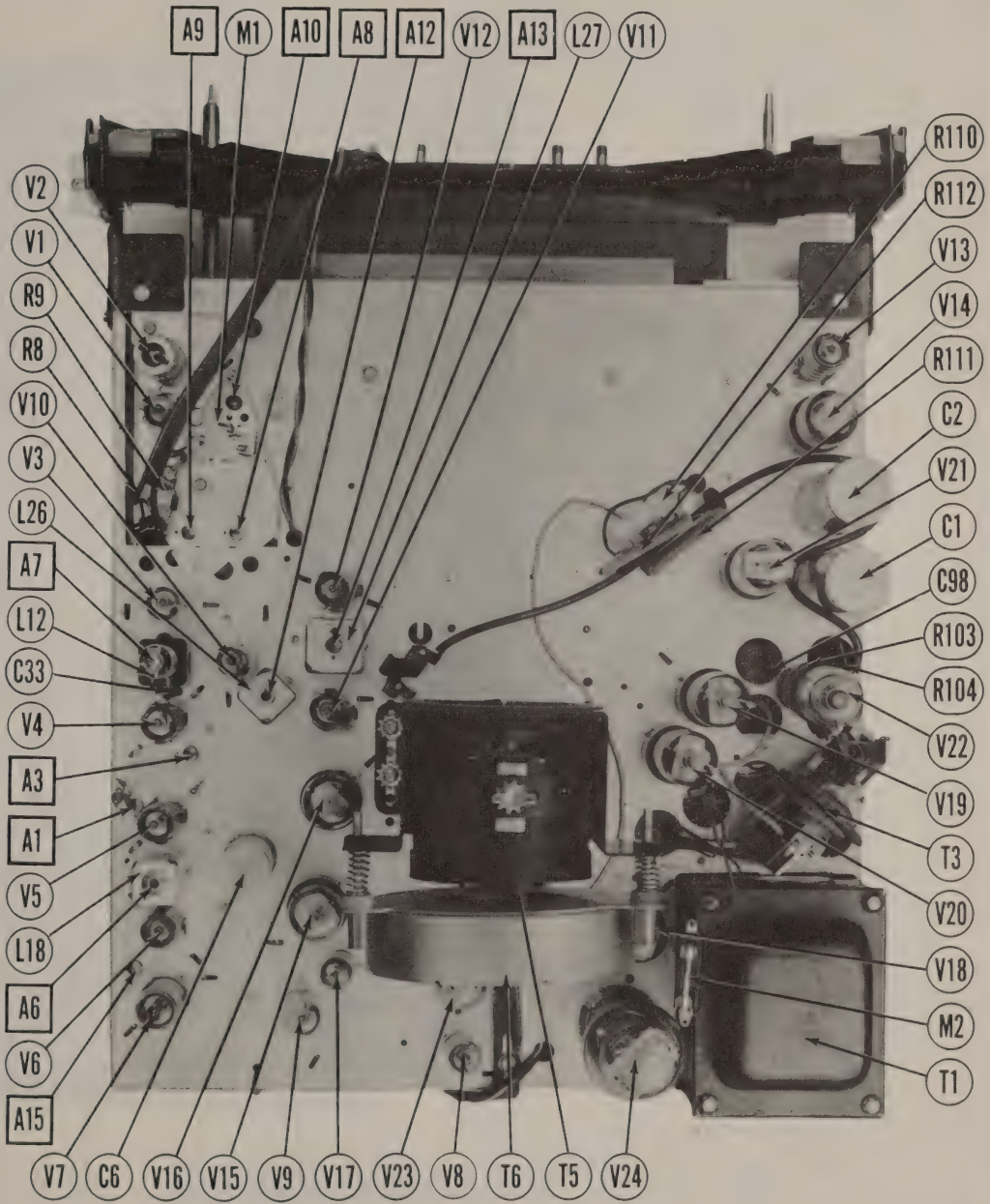
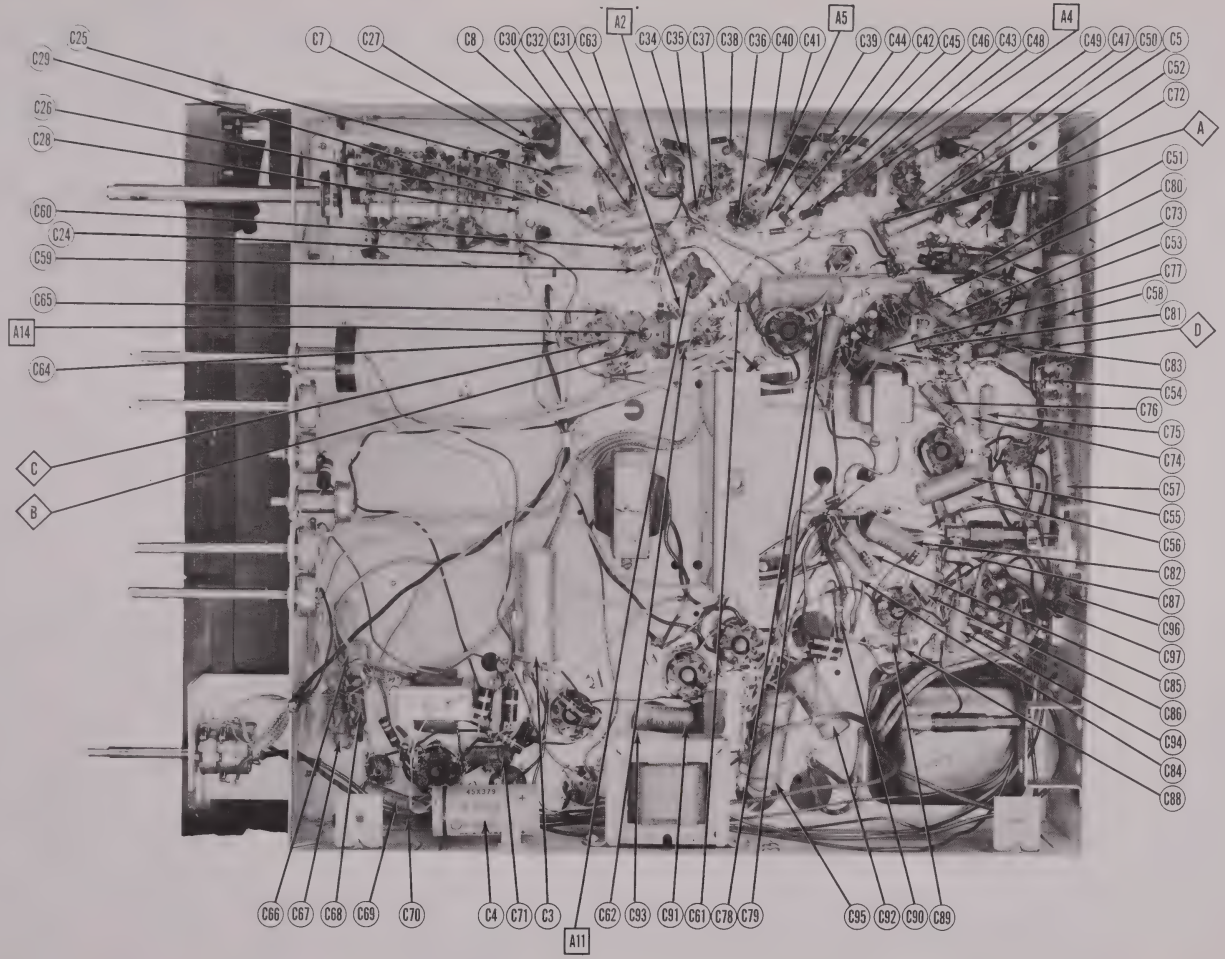
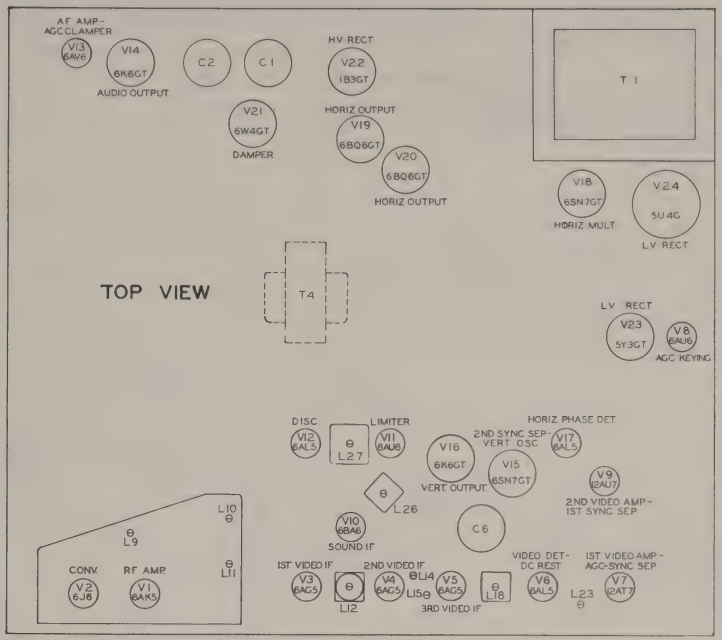
TRUETONE
MODEL 2D1089A

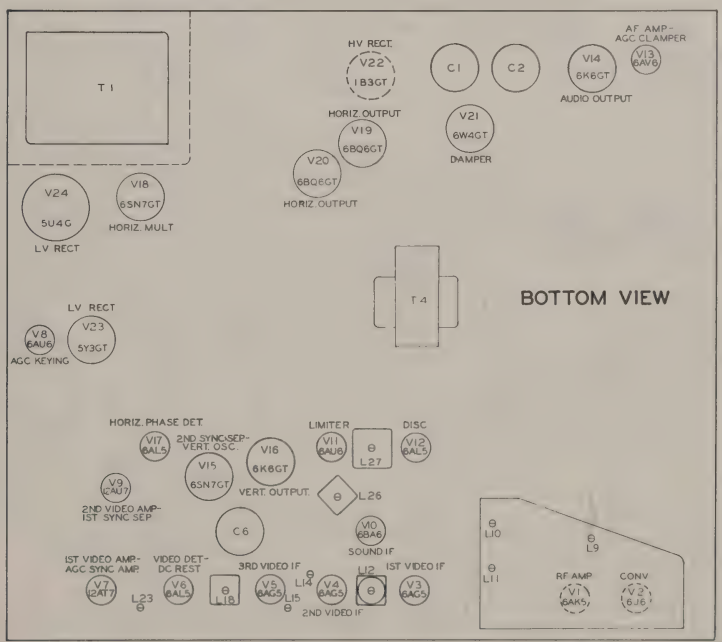


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To eliminate the high voltage shock hazard remove the horizontal multivibrator tube (V18) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 with pin 1 removed to prevent erroneous indications.

This receiver employs one of two tuners, a switch type tuner or a turret type tuner. The frequency used when adjusting A4 when the switch type tuner is employed differs slightly from the frequency used with the turret type tuner. The frequency used with a switch type tuner will be designated by an "asterisk" (*) and the frequency used with a turret type tuner will be designated by a "dagger" (†). Determine which tuner is employed before attempting Video IF Alignment. Before attempting step 8 short out the AGC line.

In step 9 connect the negative terminal of a 3 volt battery to the junction of R23 and C35 and positive terminal to chassis. If turret type tuner is employed, omit step 7.

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	Not used	20.2MC (Unmod.)	Any	Use VTVM. DC Probe to Point (A) Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	Direct	"	"	22.7MC	"	"	A2	Adjust for maximum deflection.
3.	Direct	"	"	25.7MC	"	"	A3	"
4.	Direct	"	"	24.1MC * 23.7MC †	"	"	A4	"
5.	Direct	"	"	27.7MC	"	"	A5	Adjust for MINIMUM deflection.
6.	Direct	"	"	21.7MC	"	"	A6, A7	"
7.	Direct	"	"	17MC	"	"	A8	"
8.	Direct	"	24MC (10MC SWP)	21.7MC 26.2MC	"	Vert. Amp. thru detector probe as shown in figure 1 to pin 5 (plate) of 6AG5 (V3). Low side to chassis.	A9, A10	Adjust for response curve similar to figure 2 with markers as shown. A slight readjustment of A8 may be necessary for optimum results. The response for turret type tuner is shown by dotted line in figure 2.
9.	Direct	"	"	21.7MC 22.4MC 22.6MC 25.25MC 26.2MC	"	"		Check for response curve similar to figure 3. The 22.4MC and 26.2MC markers should be at 50% response. If necessary, slightly retouch A2, A3, and A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	21.7MC (Unmod.)	Any	DC Probe to Point (B). Common to chassis.	A11, A12, A13	Adjust for maximum deflection.
11.	Direct	"	"	"	DC Probe to Point (C) Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassi chassis.	21.7MC (450KC SWP)	21.7MC	Any	Vert. Amp. thru 10KΩ to pin 1 (Grid) of 6AU6 (V11). Low side to chassis.	A11, A12	Adjust for maximum amplitude and symmetry as per figure 4.
11.	Direct	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A13, A14	Adjust A14 to place 21.7MC at center of diagonal line as per figure 5. Adjust A13 for maximum amplitude and straightness of diagonal line.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.001MFD	High side to pin 2 (Grid) of 12AT7 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe thru detector probe as per figure 1 to Point (D). Common to chassis.	A15	Adjust for MINIMUM deflection.

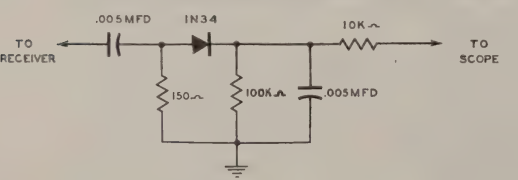


FIG.1

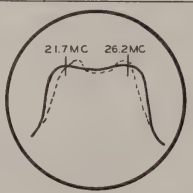


FIG.2

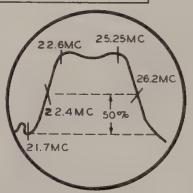


FIG.3

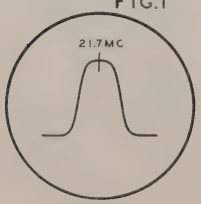


FIG.4

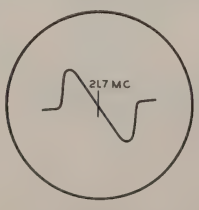


FIG.5

FIG.6

OSCILLATOR ALIGNMENT (SWITCH TYPE TUNER)

Remove the dummy converter tube and replace original 6J6 in its socket.
Connect a 3 volt battery as in step 9 of Video IF Alignment.
The RF portion of this tuner is pre-set at the factory and is very stable and should not require adjustment in the field.
Set the fine tuning control to the mid-position of its range.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	215.75MC (Unmod.)	13	DC Probe to Point Ⓒ. Common to chassis.	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
14.	"	"	209.75MC	12	"		Check all high band channels to see if a zero reading can be obtained well within the range of the fine tuning control. If not, a compromise adjustment of A16 will be required.
			203.75MC	11			
			197.75MC	10			
			191.75MC	9			
			185.75MC	8			
			179.75MC				
15.	"	"	87.75MC	6	"	A17	Adjust for zero reading. A positive and negative reading wil be obtained on either side of the correct setting.
16.	"	"	81.75MC	5	"		Check all low band channels to see if a zero reading can be obtained well within the range of the fine tuning control. If not a compromise adjustment of A17 will be required.
			71.75MC	4			
			65.75MC	3			
			59.75MC	2			

RF AND MIXER ALIGNMENT (TURRET TYPE TUNER)

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point Ⓔ. Low side to chassis.	A18, A19, A20	Adjust for flat top response curve similar to figure 6 with markers as shown.
18.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check the position of markers on all channels. If maximum reception is desired for one specific channel, adjust A18, A19 and A20 on that channel and then check all other channels to make certain that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

OSCILLATOR ALIGNMENT (TURRET TYPE TUNER)

Remove the dummy converter tube and replace the original 6J6 in its socket.
Connect a 3 volt battery as in step 9 of Video IF Alignment.
Complete oscillator alignment may not be necessary. This is determined by checking to see that a zero reading is obtained for each channel when the fine tuning control is turned through the mid-point of its range. (connect signal generator and VTVM as in steps 19 and 20. Sound carrier frequencies are listed in step 20). If the majority of the channels seem to need oscillator alignment this sometimes may be done in one operation -step 19, by adjusting A21. It should be noted that this is an all channel adjustment and should not be adjusted for any individual channels. If step 19 fails to align the oscillator circuit sufficiently, it will be necessary to adjust the individual channel oscillator slugs. These are accessible one channel at a time through the small hole to the right of the channel switch shaft as the channel switch is rotated to each channel.
The signal generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
19.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	215.75MC	13	DC Probe to Point Ⓒ. Common to chassis.	A21	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Rotate channel switch and adjust oscillator slugs for each individual channel as in step 20. Then repeat step 19.
20.	"	"	215.75MC	13	"	A22	
			209.75MC	12		A23	
			203.75MC	11		A24	
			197.75MC	10		A25	
			191.75MC	9		A26	
			185.75MC	8		A27	
			179.75MC	7		A28	
			87.75MC	6		A29	
			81.75MC	5		A30	
			71.75MC	4		A31	
			65.75MC	3		A32	
			59.75MC	2		A33	

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AK5	-.4VDC	.9VDC	6.3VAC	0V.	90VDC	90VDC	.9VDC		
V 2	6J6	75VDC	95VDC	0V.	6.3VAC	-1.4VDC	§-3.7VDC	0V.		
V 3	6AG5	-1.2VDC	.3VDC	0V.	6.3VAC	105VDC	110VDC	.3VDC		
V 4	6AG5	-1.2VDC	.3VDC	6.3VAC	0V.	105VDC	105VDC	.3VDC		
V 5	6AG5	-.3VDC	1.3VDC	6.3VAC	0V.	110VDC	110VDC	1.3VDC		
V 6	6AL5	0V.	0V.	6.3VAC	0V.	1.4VDC	0V.	-.9VDC		
V 7	12AT7	105VDC	-.9VDC	0V.	6.3VAC	6.3VAC	210VDC	0V.	6.4VAC	0V.
V 8	6AU6	125VDC	130VDC	0V.	6.3VAC	-.5VDC	215VDC	130VDC		
V 9	12AU7	200VDC	0V.	9.6VDC	6.3VAC	6.3VAC	7.7VDC	0V.	1.2VDC	0V.
V 10	6BA6	0V.	0V.	0V.	6.3VAC	110VDC	110VDC	1.5VDC		
V 11	6AU6	-.7VDC	0V.	6.3VAC	0V.	125VDC	85VDC	0V.		
V 12	6AL5	.2VDC	-.7VDC	6.3VAC	1VAC	0V.	0V.	-.7VDC		
V 13	6AV6	-1.6VDC	0V.	6.3VAC	0V.	0V.	-1.2VDC	90VDC		
V 14	6K6GT	-.4VDC	0V.	180VDC	190VDC	0V.	195VDC	6.3VAC	13VDC	
V 15	6SN7GT	-18VDC -16VDC	190VDC 95VDC	0V.	1.2VDC	100VDC	23VDC	0V.	6.3VAC	
V 16	6K6GT	0V. 37VDC	6.3VAC	320VDC	320VDC	0V.	0V.	0V.	35VDC 52VDC	
V 17	6AL5	0V.	0V.	6.3VAC	0V.	3VDC	0V.	-3VDC		
V 18	6SN7GT	.3VDC	330VDC	14VDC	-7.2VDC -5.4VDC	120VDC	14VDC	0V.	6.3VAC	
V 19	6BQ6GT	0V.	6.3VAC	0V.	100VDC	.7VDC	.7VDC	0V.	15VDC	TOP CAP *
V 20	6BQ6GT	460VDC	0V.	330VDC	100VDC	.7VDC	0V.	6.3VAC	15VDC	TOP CAP *
V 21	6W4GT	460VDC	0V.	460VDC	0V.	330VDC	0V.	6.3VAC	0V.	
V 22	1B3GT		* DO NOT MEASURE.							
V 23	5Y3GT	0V.	340VDC	0V.	335VAC	0V.	335VAC	0V.	340VDC	
V 24	5U4G	0V.	340VDC	0V.	335VAC	335VAC	335VAC	335VAC	340VDC	
V 25	16EP4A	0V.	.6VDC	PIN 10 370VDC	PIN 11 19VDC 130VDC	PIN 12 6.3VAC				

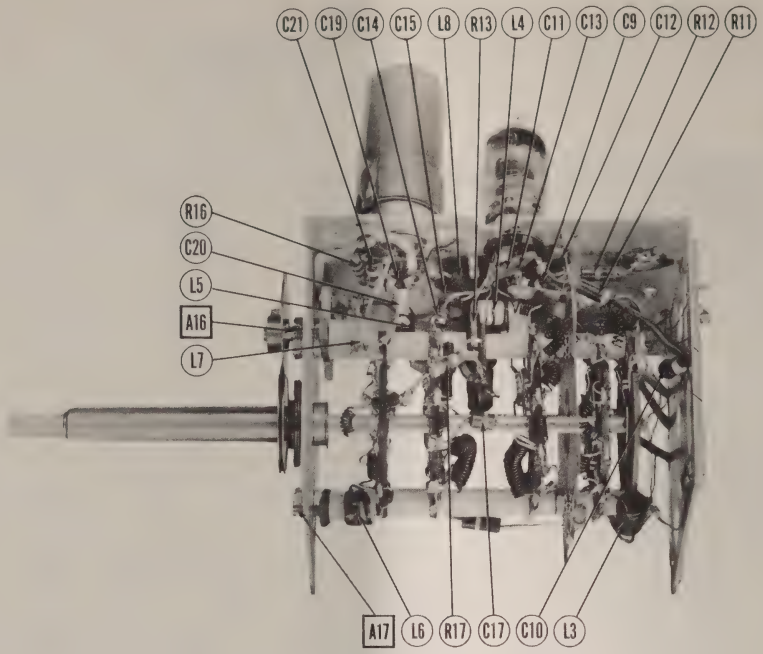
FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE.

RESISTANCE READINGS

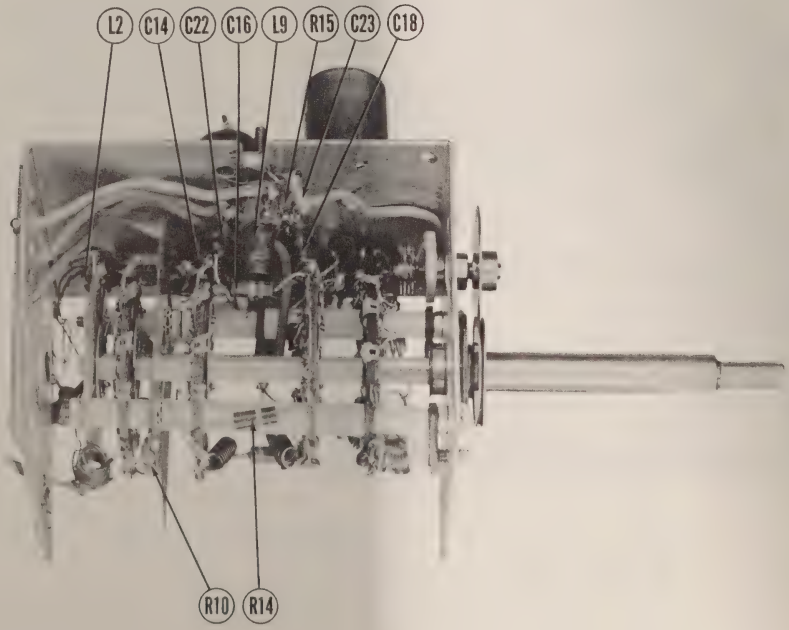
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AK5	650KΩ	100Ω	.1Ω	0Ω	†7KΩ	†7KΩ	100Ω		
V 2	6J6	†7KΩ	†8KΩ	0Ω	.2Ω	270KΩ	22KΩ	0Ω		
V 3	6AG5	105KΩ	47Ω	0Ω	.1Ω	†3.6KΩ	†3.6KΩ	47Ω		
V 4	6AG5	105KΩ	33Ω	.1Ω	0Ω	†3.5KΩ	†3.5KΩ	33Ω		
V 5	6AG5	12KΩ	150Ω	.1Ω	0Ω	†4.3KΩ	†4.3KΩ	150Ω		
V 6	6AL5	.3Ω	0Ω	.1Ω	0Ω	1 Meg.	0Ω	4.7KΩ		
V 7	12AT7	†10KΩ	4.7KΩ	.3Ω	.1Ω	.1Ω	†13KΩ	1 Meg.	22KΩ	0Ω
V 8	6AU6	†40KΩ	†2.1KΩ	0Ω	.1Ω	390KΩ	†1.1KΩ	†2.1KΩ		
V 9	12AU7	†5KΩ	1 Meg.	3.1KΩ	.1Ω	.1Ω	†80KΩ	0Ω	47KΩ	0Ω
V 10	6BA6	0Ω	0Ω	0Ω	.1Ω	†3.2KΩ	†3.2KΩ	82Ω		
V 11	6AU6	470KΩ	0Ω	.1Ω	0Ω	†3.2KΩ	†25KΩ	0Ω		
V 12	6AL5	200KΩ	100KΩ	.1Ω	2.2Ω	0Ω	0Ω	100KΩ		
V 13	6AV6	10 Meg.	0Ω	.1Ω	0Ω	Inf.	650KΩ	†320KΩ		
V 14	6K6GT	600KΩ	0Ω	†2.5KΩ	†2.1KΩ	470KΩ	†30KΩ	.1Ω	470Ω	
V 15	6SN7GT	1.6 Meg. 2.6 Meg.	▲1 Meg. ▲3.5 Meg.	0Ω	1 Meg.	†6.4KΩ	3.3KΩ	0Ω	.1Ω	
V 16	6K6GT	0Ω 5KΩ	.1Ω	†1.2KΩ	†1.2KΩ	3.3 Meg.	Inf.	0Ω	7.2KΩ 2.2KΩ	
V 17	6AL5	27KΩ	27KΩ	.1Ω	0Ω	4.8 Meg.	Inf.	4.8 Meg.		
V 18	6SN7GT	5.2 Meg.	▲15KΩ	1.5KΩ	100KΩ 150KΩ	▲280KΩ	1.5KΩ	0Ω	.1Ω	
V 19	6BQ6GT	Inf.	.1Ω	Inf.	†22KΩ	470KΩ	470KΩ	0Ω	110Ω	TOP CAP ▲30Ω
V 20	6BQ6GT	▲0Ω	0Ω	†320Ω	†22KΩ	470KΩ	11Ω	.1Ω	110Ω	TOP CAP ▲30Ω
V 21	6W4GT	▲0Ω	Inf.	118KΩ	Inf.	†50Ω	Inf.	.1Ω	0Ω	
V 22	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ▲510Ω
V 23	5Y3GT	Inf.	12KΩ	Inf.	20Ω	Inf.	20Ω	Inf.	12KΩ	
V 24	5U4G	Inf.	12KΩ	Inf.	42Ω	20Ω	42Ω	20Ω	12KΩ	
V 25	16EP4A	0Ω	1.1 Meg.	PIN 10 ▲10KΩ	PIN 11 100KΩ 11KΩ	PIN 12 .1Ω				

FOCUS CONTROL SET FULLY COUNTERCLOCKWISE.
† MEASURED FROM PIN 2 OF V24.
▲ MEASURED FROM PIN 3 OF V21.

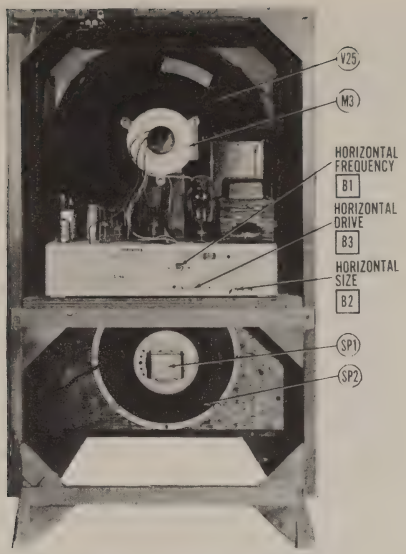
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



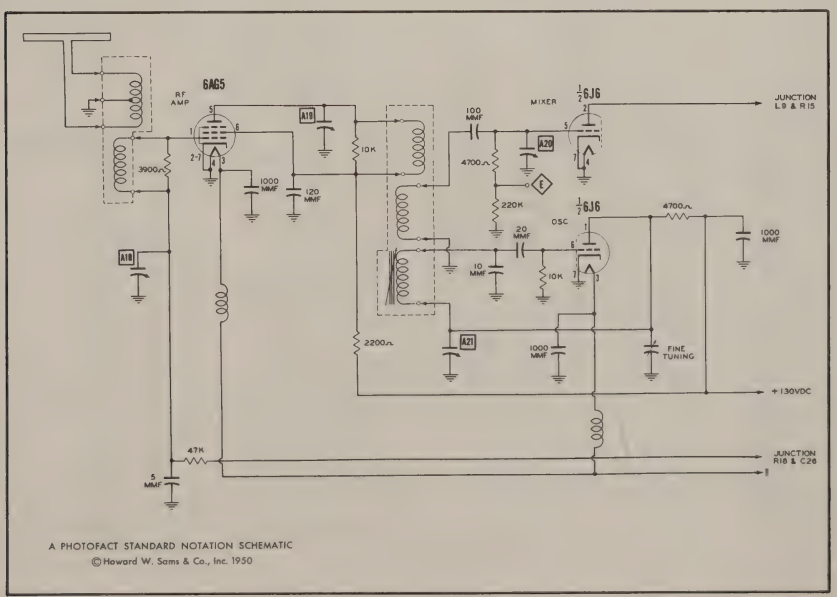
CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Turn the horizontal size slug (B2) fully clockwise and adjust the horizontal drive trimmer (B3) for best linearity from left to right. Readjust B2 until picture fills the mask horizontally. If the B3 is opened counter-clockwise too far, a white line may appear at the left center portion of the picture.



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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ALTERNATE TUNER

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6AK5	6AK5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AG5	6AG5	7BD	
V4	2nd Video IF	6AG5	6AG5	7BD	
V5	3rd Video IF	6AG5	6AG5	7BD	
V6	Video Det. -DC Rest.	6AL5	6AL5	6BT	
V7	1st Video Amp. - AGC-Sync. Amp.	12AT7	12AT7	9A	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	2nd Video Amp. - 1st Sync. Sep.	12AU7	12AU7	9A	
V10	Sound IF Amp.	6BA6	6BA6	7BK	
V11	Limiter	6AU6	6AU6	7BK	
V12	Disc	6AL5	6AL5	6BT	
V13	AF Amp.-AGC Clamper	6AV6	6AV6	7BT	
V14	Audio Output	6K6GT	6K6GT	7S	
V15	2nd Sync. Sep.-Vert. Osc	6SN7GT	6SN7GT	8BD	
V16	Vert. Output	6K6GT	6K6GT	7S	
V17	Hor. Phase Det.	6AL5	6AL5	6BT	
V18	Hor. Mult.	6SN7GT	6SN7GT	8BD	
V19	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V20	Hor. Output Damper	6BQ6GT	6BQ6GT	6AM	
V21	HV Rect.	6W4GT	6W4GT	4CG	
V22	HV Rect.	1B3GT	1B3GT	3C	
V23	LV Rect.	5Y3GT	5Y3GT	5T	
V24	LV Rect.	5U4G	5U4G	5T	
V25	Picture Tube	16EP4A	16EP4A	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	80	450	452376	AF166J		UPT44445		TVL-2777	▲ Filter
B	30	450							▲ Filter
C2A	80	450	452376	AF166J		UPT44445		TVL-2777	▲ Filter
B	30	450							▲ Filter
C3A	10	450	452375	AF322BB		UPT145V4		TVL-3749	▲ Output Decoup. ▲ Decoupling Output Cathode
B	10	450							
C	40	350							Filter
C4	30	450	452379	PRS450/30		BR3045A		TVA-1711	
C5	5	25	452378	PRS150/4		BSR5-25		TVA-1203	Sync. Amp. Cath.
C6A	10	450	452375	AF322BB		UPT145V4		TVL-3749	▲ Vert. Osc. Dec. ▲ Vert. Output Dec.
B	10	450							Vert. Output Cath.
C7	1000		47X519	SI1000	D6-102		GP2L-001	19C1	Ant. Coupling
C8	1000		47X519	SI1000	D6-102		GP2L-001	19C1	Ant. Coupling
C9	10			SI25	D6-150		GP2K-15	19C22	RF Coupling
C10	680			SI680	D6-681		GP2K-680	19C17	AGC Filter
C11	500			BPD-001	DD-102		81L-001	19C1	RF Decoupling
C12	680			SI680	D6-681		GP2K-680	19C17	RF Cathode
C13	1000			BPD-001	DD-102		81L-001	19C1	RF Suppressor
C14	470			SI470	D6-471		GP2K-470	19C15	RF Plate Dec.
C15	25								RF Coupling
C16	5				TCZ-.5				RF Coupling
C17	1.8								RF Coupling
C18	470			SI470	D6-471		GP2K-470	19C15	Mixer Grid Filter
C19	25								Osc. Coupling
C20	10			SI10NPO	TCZ-10		NPOK-10	19C3	Osc. Grid Cap.
C21	3			SI3NPO	TCZ-3.3		NPOK-3		Osc. Feedback
C22A	1000			BPD-3 x 001	DD-2-102		882-3 x 001	29C7	Osc. Coupling
B	1000								Conv. Fil. Bypass
C23	10			SI10NPO	TCZ-10		NPOK-10	19C3	Fixed Trimmer
C24	68		47X508		TCN-68		N750L-68	29C15	Fixed Trimmer
C25	270	500	472X445	1468-00025	D6-271	5WS2T25	GP2K-270	1FM-325	IF Coupling
C26	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	AGC Filter
C27	.5	200	B65504		P288-.5		GT2P5	2TM-P5	AGC Filter
C28	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	Filament Bypass
C29	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	AGC Filter
C30	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	RF Bypass
C31	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	1st V. IF Dec.
C32	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	1st V. IF Fil.
C33	47			SI47NPO	TCZ-47		NPOM-47	29C14	Fixed Trimmer
C34	270	500	472X445	1468-00025	D6-271	5WS2T25	GP2K-270	1FM-325	IF Coupling
C35	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	AGC Filter
C36	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	AGC Filter
C37	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	2nd V. IF Dec.
C38	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	2nd V. IF Fil.
C39	75			SI75NPO	TCZ-75		NPOM-75		Fixed Trimmer
C40	270	500	472X445	1468-00025	D6-271	5WS2T25	GP2K-270	1FM-325	IF Coupling
C41	47	500	472X581	1469-00005	TCZ-47	5RS2Q5	NPOM-50	MS-45	Fixed Trimmer
C42	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	RF Bypass
C43	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	3rd V. IF Dec.
C44	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	3rd V. IF Cath.
C45	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	3rd V. IF Fil.
C46	270	500	472X445	1468-00025	D6-271	5WS2T25	GP2K-270	1FM-325	IF Coupling
C47	5		472X562	SI5	TCZ-4.7	5WS5	GP5K-5	MS-55	V. Det.-DC Res. Fil.
C48	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	Fixed Trimmer
C49	360	500	472X568	1464-00035			GP2K-360	1FM-325	Peaking
C50	43		47X562		TCZ-43		NPOM-43		Video Coupling
C51	.05	400	D67503	P488-05	D2-503	PTE4S5		4TM-S5	Video Coupling
C52	.05	400	D67503	P488-05	D2-503	PTE4S5		4TM-S5	Video Coupling
C53	.1	400	D65104	P488-1	D2-104	PTE4P1		4TM-P1	Video Coupling
C54	.05	600	D67503	P488-05	D2-503	PTE4S5		4TM-S5	Video Coupling
C55	.1	200	B65104	P288-1	D2-104	PTE4P1		2TM-P1	Pic. Tube Cath.
C56	1000	1000	47X569	1464-BV-001					Hor. Sweep Coupling
C57	.05	400	D67503	P488-05	DF-503	PTE4S5		4TM-S5	AGC Filter
C58	.5	200	B65504	P288-5		GT2P5		2TM-P5	AGC Filter
C59	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	S. IF Decoupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C60	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	S. IF Cath.
C61	5000		47X507	BPD-005	DD-502	1DSD5	81L-005	29C1	Limiter Grid Filter
C62	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	Limiter Screen
C63	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	Limiter Plate Dec.
C64	5000		47X507	BPD-005	DD-502	1DSD5	81L-005	29C1	Discr. Fil.
C65	270	500	47X445	1468-00025	D6-271	5WS2T25	GP2K-270	1FM-325	RF Bypass
C66	.05	200	D67503	P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C67	.005	600	B65502	P668-005	D6-502	PTE5D5	81L-505	6TM-D5	Tone Comp.
C68	.01	200	B65103	P488-01	D6-103	PTE4S1	81L-01	4TM-S1	Audio Coupling
C69	.05	400	D67503	P488-05	DF-503	PTE4S5		4TM-S5	AF Amp. Plate Dec.
C70	.05	400	D67503	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C71	.005	600	P68302	P668-005	D6-502	PTE5D5	81L-005	6TM-D5	Output Plate Byp.
C72	.1	400	P68104	P488-1	DF-104	PTE4P1		4TM-P1	Sync. Coupling
C73	.05	400	D67503	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C74	.002	600	B65202	P668-002	D6-202	PTE5D2	GP2M-002	6TM-D2	Integrator Net.
C75	.005	600	D65502	P668-005	D6-502	PTE5D5	81L-005	6TM-D5	Integrator Net.
C76	.005	600	B65502	P668-005	D6-502	PTE5D5	81L-505	6TM-D5	Integrator Net.
C77	4700	500	47X543	1467-005	D6-472	1DSD5	GP2M-0047	1FM-25	Vert. Sync. Coupling
C78	.02	600	P65203	P668-02		PTE5S2		6TM-S2	Vert. Discharge
C79	.25	400	D65254	P488-25		GT4P25		4TM-P25	Vert. Sweep Coupling
C80	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	Hor. Sync. Coupling
C81	1000		47X519	SI1000	D6-102	1WSD1	GP2L-001	29C21	Hor. Sync. Coupling
C82	.05	600	P67503	P668-05	DF-503	PTE5S5		6TM-S5	Hor. Feedback
C83	.01	200	B65103	P488-01	D6-103	PTE4S1	81L-01	4TM-S1	Voltage Divider
C84	.005	600	P65502	P668-005	D6-502	PTE5D5	81L-005	6TM-D5	AFC Filter
C85	.05	200	B65503	P288-05	DF-503	PTE4S5		2TM-S5	AFC Filter
C86	330	500	472X570	1468-00035	D6-331	5WS7T3	GP2K-330	1FM-325	Hor. Feedback
C87	3900	500	472X572	1464-004		IDH1S4		MS-34	Fixed Trimmer
C88	390	500	472X571	1468-004	D6-391	5WS7T4	GP2K-390	1FM-34	Hor. Discharge
C89	270	500	472X445	1468-00025	D6-271	5WS2T25	GP2K-270	1FM-325	Hor. Sweep Coupling
C90	13	2500	47X574						Hor. Feedback
C91	.05	600	P67503	P668-05	DF-503	PTE5S5		6TM-S5	Hor. Output Screen
C92	.25	200	B65254	P288-25		GT2P5		2TM-P47	Hor. Output Cath.
C93	.25	200	B65254	P468-25		GT2P25		2TM-P25	Damper Filter
C94	.05	200	D67503	P288-05	DF-503	PTE4S5		2TM-S5	Fixed Trimmer
C95	.5	200	B65504	P288-5		GT2P5		2TM-P5	Hor. Sweep Coupling
C96	.01	400	47X410	P488-01	D6-103	PTE4S1	81L-01	4TM-S1	Line Filter
C97	.01	400	47X410	P488-01	D6-103	PTE4S1	81L-01	4TM-S1	Line Filter
C98	500	20000	47X560		HV20C		TV3-502		HV Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	5000Ω	½		Concentrikit B11-112 *			Contrast control-front
B	1 Meg.	½	78X4	B13-137X *		SBBT-503-S	Volume control-tapped at 200KΩ-rear
C	Shaft End			S-S-302 *			Attach per instr. in "Concentrikit"
D	Switch			76-1 *			Attach per instr. in "Concentrikit".
R2A	50KΩ	½	40X399	Q11-123, C-3†	AG-44-S	B-31	Horiz. hold control
B	Shaft		Not Reg.	Not Reg.	KSS-5	AK-16 #	Attach to R2A per instructions
R3A	500KΩ	½	40X397	Q11-153, C-3†	AG-58-S	B-59	Brightness control
B	Shaft		Not Reg.	Not Reg.	KSS-5	AK-16 #	Attach to R3A per instructions
R4A	5000Ω	½	40X394	Q11-114			Vert. linearity control
B	Sleeve						
	Bushing		Not Reg.	S-3			Attach to R4A per instructions
R5A	2.5 Meg.	½	40X393	Q11-239	AG-84-S	B-83 †	Height control
B	Shaft		Not Reg.	Reg.	FKS-1/4	Not Reg.	Attach to R5A per instructions
R6A	1 Meg.	½	40X398	Q11-137, C-3†	AG-61-S	B-69	Vert. hold control
B	Shaft		Not Reg.	Not Reg.	KSS-5	AK-16 #	Attach to R6A per instructions
R7	6500Ω	2	40X302			SV-919	Focus control-Wire Wound

* Additional parts to be used with "Concentrikit".
† File slot to shaft to make original.
‡ Saw off shaft of new control so that C-3 coupler can be employed to connect part of original shaft to new control.
# Cut off shaft to replacement control and attach original shaft using coupler.

RESISTORS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R8	1000Ω	½	B85102	BTS-1000	Antenna Isolation
R9	1000Ω	½	B85102	BTS-1000	Antenna Isolation
R10	470Ω	½	B83472	BTS-4700	RF Coil Shunt
R11	1000Ω	½	B85102	BTS-1000	RF Amp. Grid
R12	100Ω 20%	½	B84101	BTS-100	RF Amp. Cathode
R13	4700Ω	½	B83472	BTS-4700	RF Amp. Decoupling
R14	270KΩ 20%	½	B85274		Mixer Grid
R15	5600Ω	½	B83562		Mixer Plate
R16	22KΩ	½	B84223		RF Bypass
R17	4700Ω	½	B83472	BTS-4700	Osc. Plate
R18	1000Ω	½	B85102	BTS-1000	AGC Network
R19	5600Ω 5%	½	B83562		1st Video IF Amp. Grid
R20	47Ω 5%	½	B83470		1st Video IF Amp. Cathode
R21	1000Ω	½	B85102	BTS-1000	1st Video IF Amp. Decoupling
R22	150Ω	½	B84151	BTS-150	Decoupling
R23	1000Ω	½	B85102	BTS-1000	AGC Network
R24	82000 5%	½	B83822		2nd Video IF Amp. Grid
R25	33Ω 5%	½	B83330		2nd Video IF Amp. Cathode
R26	1000Ω	½	B85102	BTS-1000	2nd Video IF Amp. Decoupling
R27	12KΩ 5%	½	B83123		3rd Video IF Amp. Grid
R28	150Ω	½	B84151	BTS-150	3rd Video IF Cathode
R29	330Ω	½	B84331	BTS-330	Decoupling
R30	22KΩ	½	B84223		3rd Video IF Coil Shunt
R31	2200Ω	½	B84223	BTS-2200	De coupling
R32	4700Ω 5%	½	B83472	BTS-4700-5%	Video Det. Diode Load
R33	5600Ω	1	C84562	BTA-5600	1st Video Amp. Plate
R34	27000 5%	1	C83272	BTA-2700-5%	1st Video Amp. Plate
R35	33KΩ	½	B84333	BTS-33K	AGC Keying Grid
R36	22KΩ	½	B84223	BTS-22K	AGC Network
R37	470KΩ	½	B85474	BTS-470K	AGC Network
R38	270KΩ	½	B85274	BTS-270K	AGC Network
R39	100KΩ	½	B84104	BTS-100K	AGC Network
R40	1 Meg.	½	B84105	BTS-1 Meg.	2nd Video Amp. Grid

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	IDENTIFICATION CODES
R41	100Ω	½	B84101	BTS-100	2nd Video Amp. Cathode
R42	3900Ω 5%	½	B83392	BTS-3900-5%	2nd Video Amp. Plate
R43	10KΩ	½	B84104	BTS-10K	Isolation
R44	100KΩ 20%	½	B84104	BTS-100K	Picture Tube Grid
R45	1 Meg.	½	B84106	BTS-1 Meg.	DC Rest. Load
R46	100KΩ 20%	½	B84104	BTS-100K	Voltage Divider
R47	82Ω	½	B84820		Sound IF Amp. Cathode
R48	1000Ω	½	B85102	BTS-1000	Sound IF Amp. Decoupling
R49	470KΩ 20%	½	B85474		Limiter Grid
R50	22KΩ	½	B84223		Limiter Screen
R51	1000Ω	½	B85102	BTS-1000	Limiter Plate Decoupling
R52	5.1Ω	1	43X239	BW-1-4.7	Disc. Filament-Wire Wound
R53	100KΩ	½	B84104	BTS-100K	Disc. Diode Load
R54	100KΩ	½	B84104	BTS-100K	Disc. Diode Load
R55	68KΩ	½	B84683	BTS-68K	Tone Compensation
R56	10 Meg. 20%	½	B85106	BTS-10 Meg.	AF Amp. Grid
R57	270KΩ 20%	½	B85274	BTS-270K	AF Amp. Plate
R58	47KΩ 20%	½	B84473	BTS-47K	AF Amp. Plate Decoupling
R59	22KΩ	½	B84223	BTS-22K	AGC Network
R60	470KΩ 20%	½	B85474	BTS-470K	Audio Output Grid
R61	470Ω	½	C84471	BTA-470	Audio Output Cathode
R62	2.2 Meg.	½	B84225	BTS-2.2 Meg.	AGC Network
R63	2000Ω	2	D84102	BTS-1000	Audio Output Decoupling
R64	10KΩ	½	B84104	BTS-10K	Isolation
R65	1 Meg.	½	B84105	BTS-1 Meg.	Sync. Amp. Grid
R66	12KΩ	½	B83123	BTS-12K	Sync. Amp. Plate
R67	22KΩ	½	B84223	BTS-22K	Sync. Amp. Cathode
R68	2200Ω	½	B84222	BTS-2200	Isolation
R69	47KΩ 5%	½	B84473	BTS-47K-5%	1st Sync. Sep. Cathode
R70	820KΩ	½	B84824	BTS-820K	1st Sync. Sep. Plate
R71	68KΩ	½	B84683	BTS-68K	Voltage Divider
R72	1 Meg.	½	B84105	BTS-1 Meg.	2nd Sync. Sep. Grid
R73	33000 5%	½	B83332	BTS-3300-5%	2nd Sync. Sep. Cathode
R74	1000Ω	½	B85102	BTS-1000	2nd Sync. Sep. Plate
R75	3300Ω 5%	½	B83332	BTS-3300-5%	2nd Sync. Sep. Plate
R76	22KΩ	½	B8422K	BTS-22K	Integrator
R77	8200Ω	½	B83822	BTS-8200	Integrator
R78	8200Ω	½	B83822	BTS-8200	Integrator
R79	1.5 Meg.	½	B84155	BTS-1.5 Meg.	Vert. Osc. Grid
R80	100KΩ 20%	½	B84104	BTS-100K	Voltage Divider
R81	1 Meg.	½	B84105	BTS-1 Meg.	Vert. Osc. Plate
R82	8200Ω	½	B83822	BTS-8200	Vert. Peaking
R83	3.3 Meg 20%	½	B85335	BTS-3.3 Meg.	Vert. Output Grid
R84	2200Ω	½	B84222	BTS-2200	Vert. Output Cathode
R85	270Ω	½	B85270	BTS-270	Vert. Output Decoupling
R86	100KΩ	½	B84104	BTS-100K	Horiz. Phase Det. Diode Load
R87	100KΩ	½	B84104	BTS-100K	Horiz. Phase Det. Diode Load
R88	4.7 Meg. 20%	½	B85475	BTS-4.7 Meg.	Horiz. Phase Det. Diode Load
R89	27KΩ	½	B84273	BTS-27K	Horiz. AFC Filter Network
R90	470KΩ 20%	½	B85474	BTS-470K	Horiz. AFC Filter Network
R91	1500Ω	½	B84152	BTS-1500	Horiz. Mult. Cathode
R92	100KΩ	½	B84104	BTS-100K	Horiz. Mult. Grid
R93	47000 5%	½	B83473	BTS-4700-5%	Horiz. Mult. Plate
R94	270KΩ 20%	½	B85274	BTS-270K	Horiz. Mult. Plate
R95	470KΩ	½	B85474	BTS-470K	Horiz. Output Grid
R96	220Ω	2	D84221	BW-2-220	Horiz. Output Cathode
R97	220Ω	3	D84231	BW-3-220	Horiz. Output Cathode
R98	22KΩ	5	43X253		Horiz. Output Screen-Wire Wound
R99	150Ω	½	B84151		Parasitic Suppressor
R100	100Ω	½	B84101		Parasitic Suppressor
R101	100Ω	½	B84101		Parasitic Suppressor
R102	100Ω	½	B84101		Parasitic Suppressor
R103	3.9Ω	1	43X251		HV Rect. Filament-Wire Wound
R104	1 Meg.	½	C85105		HV Filter
R105	10KΩ	1	C84104	BTA-10K	Decoupling
R106	18KΩ	1	C84183	BTA-18K	Decoupling
R107	100KΩ	3	B84104	BTS-100K	Voltage Divider
R108	22Ω	1	C84220		Surge Limiter
R109	22Ω	1	C84220		Surge Limiter
R110	10KΩ	5	43X247	1 3/4A-10K	Bleeder-Wire Wound
R111	1000Ω	10	43X248	1 3/4A-1000	Filter-Wire Wound
R112	500Ω	10	43X245	1 3/4A-500	Filter-Wire Wound
R113	3900Ω	2	D83392	BTB-3900	Focus Coil Shunt
R114	2200Ω	2	D84222	BTB-2200	Focus Coil Shunt
R115	2200Ω	2	D84222	BTB-2200	Focus Coil Shunt
R116	4700Ω 5%	½	B83472	BTS-4700-5%	Feedback

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	720VCT	5VAC	6.3VAC	53X302			TP-360
	@ 2.2A	.270ADC	@ 5A	@ 10.6A				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	SEC.	REPLACEMENT DATA: TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	175Ω	1300Ω	54X5	A-8111 ①	A-3000 ①	TSO-2 ①	Vert. Block Osc. Trans.
T3	510Ω Tap @ 30Ω, 2.3Ω	3.8Ω Tap @ 3.8Ω SEC. 2 0Ω	43X303				Hor. Output Trans.
T4	1900Ω	10Ω	51X147	A-8112	A-3036	TSO-5 ①	Vert. Output Trans.
T5A	20Ω		9A2080	DY-7	MD-70		Hor. Deflection Coil
B	0Ω						Vert. Deflection Coil
T6	670Ω		9A2081				Focus Coil

① Drill one new mounting hole.

TRUETONE MODEL 2D1089A

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TRUETONE	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T7	7100Ω	4.2Ω	450Ω	.5Ω	51X146	A-3878	A-2931	RO-13	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	4.2Ω	12A490	ST-101 MOD. P12-T	12A4A	
	CONE DIA.	V. C. DIA.				
SP2	11 1/2"	1"				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∽)	TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.270ADC	51Ω	2 Henries	52X88	C-2326	C-2991	TR-3300①	① Drill one new mounting hole.

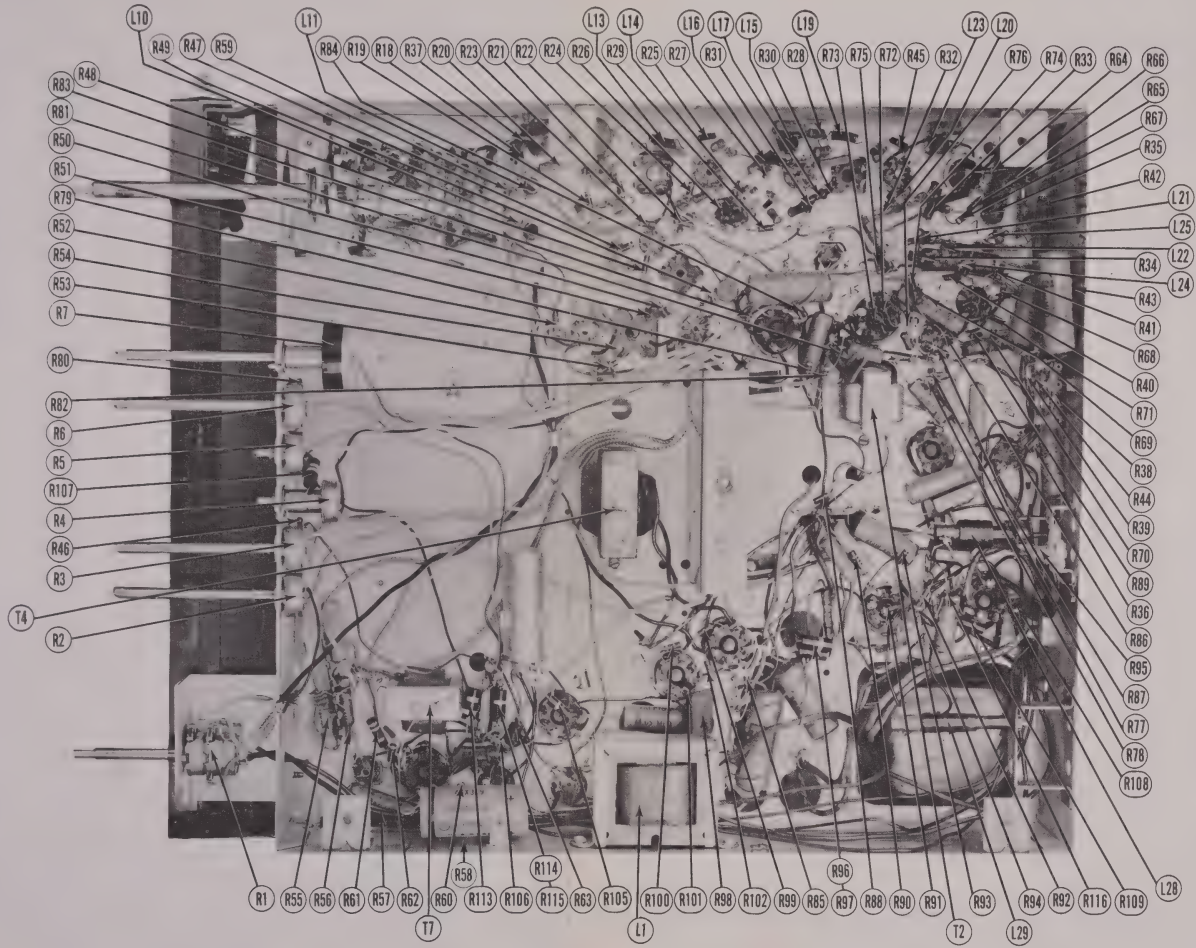
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	
L2	Ant. Coil 0Ω	0Ω	0Ω	*		
L3	Ant. Coil	0Ω	0Ω	*		
L4	RF Coil	0Ω		*		
L5	Mixer Grid	0Ω		*		
L6	Osc. Coil	0Ω		*		
L7	Osc. Coil	0Ω		*		
L8	Fil. Choke	.1Ω		*		
L9	1st Video IF	.3Ω		*		
L10	Video Trap	.2Ω		9A2059		
L11	1st Video IF Coupling	.3Ω		9A2072		
L12	2nd Video IF -Sound Take Off	.2Ω	0Ω	9A2076		
L13	Fil. Choke	0Ω		9A2033		
L14	3rd Video IF	.2Ω	0Ω	9A2055		With adj. channel sound trap
L15	Adj. Channel Video Trap	.2Ω	.2Ω	9A2073		
L16	Fil. Choke	0Ω		9A2033		
L17	RF Choke	3.8Ω		9A1979		
L18	4th Video IF	.3Ω		9A2071		With trap
L19	Fil. Choke	0Ω		9A2033		
L20	Peaking	10Ω		9A2090	19-1923	390 microhenries, gren dot
L21	Peaking	5Ω		9A2086	19-1920 †	95 microhenries, yellow dot wound on 4.7KΩ resistor.
L22	Peaking	7.2Ω		9A2088	19-1922	196 microhenries, blue dot
L23	4.5MC Trap	.3Ω		9A2074		
L24	Peaking	5.8Ω		9A2087	19-1921	125 microhenries, white dot
L25	Peaking	7Ω		9A2089	19-1921 #	183 microhenries, red dot, wound on 2.2KΩ resistor
L26	Sound IF	.2Ω	.1Ω	9A1986		
L27	Disc. Trans.	.1Ω	.1Ω	9A2049		
L28	Horiz. Osc.	50Ω		9A2096		
L29	Horiz. Size	.2Ω		9A2075		

* Part of tuner part No. 25A1074.
† Parallel with 4.7KΩ resistor.
# Parallel with 2.2KΩ resistor.

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1A	RF Tuner	25A1074	Switch type
B	RF Tuner	25A1066	Switch type
C	RF Tuner	25A1070	Turret type
M2	Fuse	16X133	.25A 250V Type MDL
M3	Ion Trap	2A104	
B3	Trimmer	17A261	Horiz. drive, 40-370MMF
	Safety Glass	17X112	
	Escutcheon	4X1065	Channel selector
	Escutcheon	4X1029	Volume, contrast
	Knob	10A741	Channel selector
	Knob	10A742	Fine tuning
	Knob	10A752	Contrast
	Knob	10A753	Volume



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

WEBSTER-CHICAGO
MODEL 100-621

WEBSTER-CHICAGO
MODEL 100-621

WEBSTER-CHICAGO MODEL 100-621

TRADE NAME	Webster-Chicago, Model 100-621
MANUFACTURER	Webster-Chicago Corp., 5610 Bloomington Ave., Chicago 39, Illinois
TYPE SET	AC Operated Automatic Record Player with Three Tube Amplifier
TUBES (THREE)	Types 12SJ7 AF Amp., 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC RATING .23 Amp. at 117Volts AC

RECORD CHANGER -- WEBSTER-CHICAGO MODEL 100

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

WEBSTER-CHICAGO
MODEL 100-621

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	AF Amp.	12SJ7	12SJ7	8N	
V2	Power Output	50L6GT	50L6GT	7AC	
V3	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WEB.-CHIC. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150		PRS150/40-		EDL44215		TVA-3448	Filter-Red
B	40	150		40-40					Filter-Red
C	20	150							Filter-Blue
C2	10	25		PRS25/10		BR102A		TVA-1204	Output Cathode *
C3	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Phono Isolation
C4	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	AF Amp. Screen
C5	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C6	.002	600		P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Tone Comp.
C7	.01	600		P688-01	D6-103	PTE6S1	811-01	6TM-S1	Output Plate Byp.
C8	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	AF Amp. Dec.
C9	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

* Not used in all models.

CONTROLS

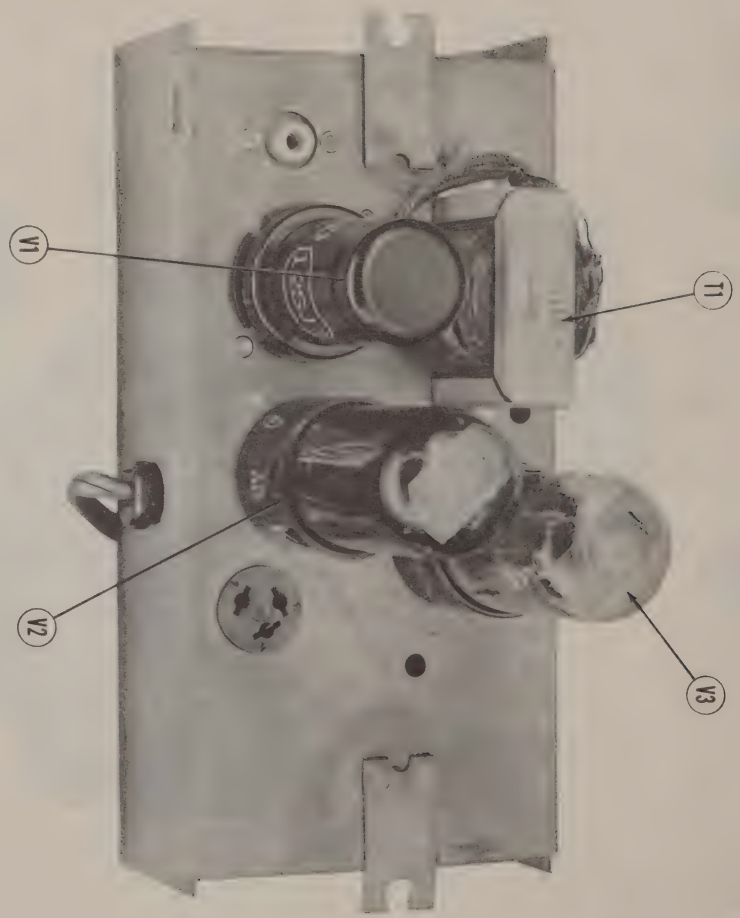
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WEB.-CHIC. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2 Meg.	½	31PO59	Q13-139	AG-66-Z		Volume control
B	Shaft		Not Req.	Not Req.	KSS-3		Attach to R1A per instructions
R2A	500KΩ	½	31PO60	Q13-133	AG-60-Z	BSK-60-S	Tone control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R2A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R2A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: WEBSTER-CHICAGO PART No.	IRC PART No.	IDENTIFICATION CODES
R3	4.7 Meg.	½		BTS-4.7 Meg.	Phono Pickup Shunt*
R4	3900Ω	½		BTS-3900	AF Amp. Cathode-See Note 1
R5	330KΩ	½		BTS-330	AF Amp. Screen
R6	100KΩ	½		BTS-100K	AF Amp. Plate
R7	15KΩ	½		BTS-15K	AF Amp. Plate Decoupling
R8	150Ω	½		BTS-150	Output Cathode
R9	3900Ω	½		BW-½-3900	Filter
R10	100Ω	½		BW-½-100	Filter
R11	27Ω	½			Surge Limiter
R12	135Ω	6	29PO52		Filament Dropping-Wire Wound
R13	220KΩ	½		BTS-220K	Isolation

Note 1. Some sets use a 3300Ω resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		WEB.-CHIC. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2000Ω	3.8Ω	180Ω	.7Ω SEC. 2 14Ω	67P018	A-3876			

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			WEBSTER-CHICAGO PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST-105		
SP1	PM	3.8Ω	76P011	MOD. P5-X	5A07	
	CONE DIA.	V. C. DIA.				
SP2	4 5/8"	9/16"				

PHONO CARTRIDGE and NEEDLE

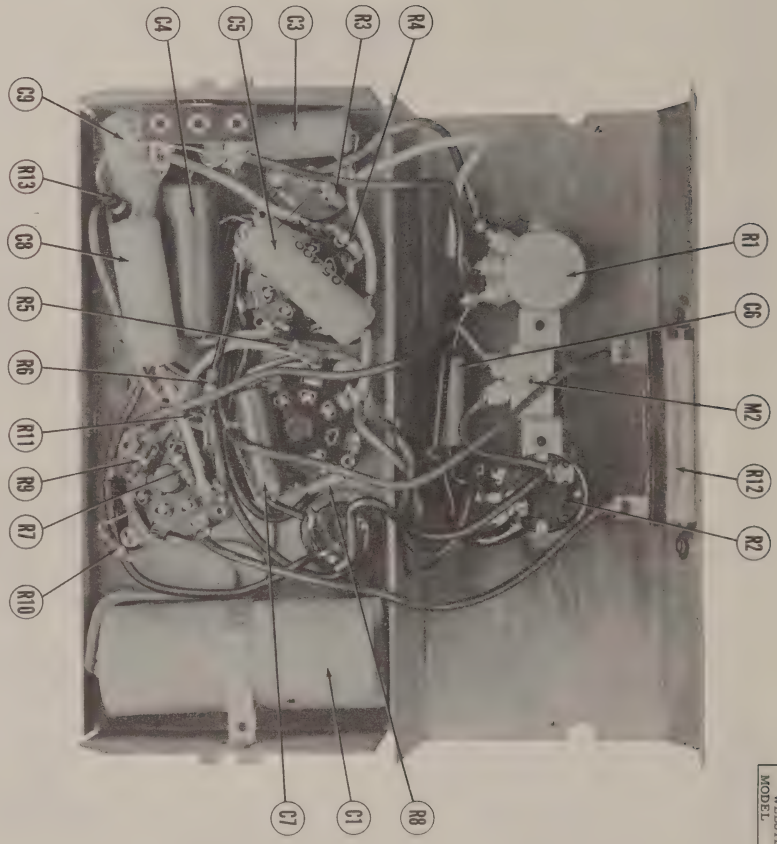
ITEM No.	REPLACEMENT DATA						REMARKS
	WEB.-CHIC. PART No.	ASTATIC PART No.		SHURE PART No.			
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE		
M1		LQS-1J	"Q" Q-33				

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

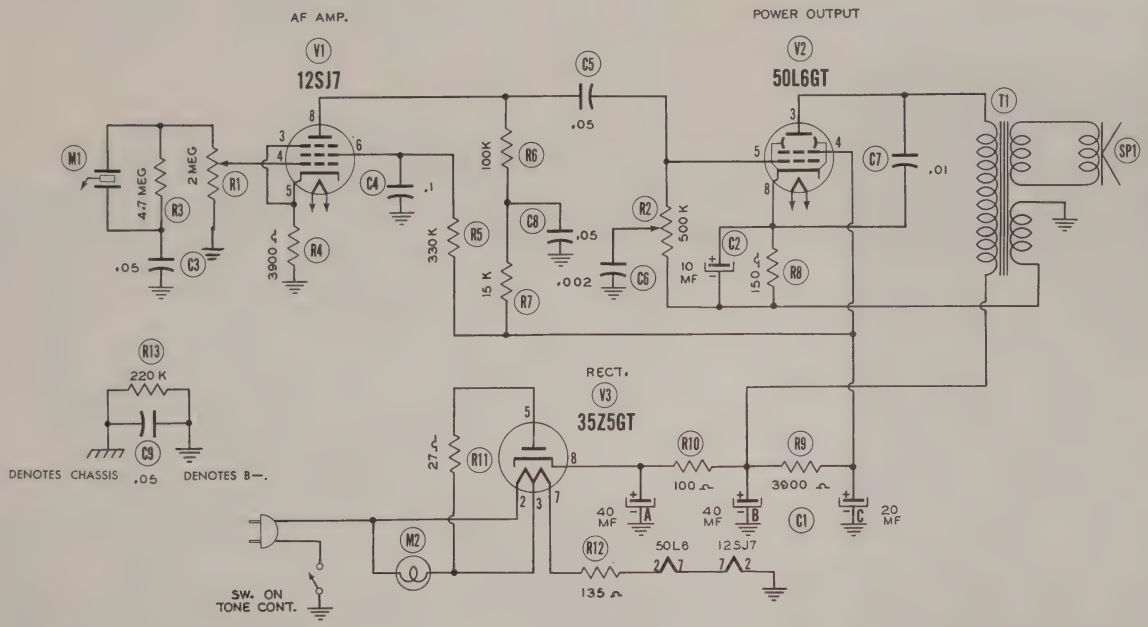
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					WEB.-CHIC. PART No.		
M2	Bayonet	6-8	.15	Brown			Type #47

CHASSIS—BOTTOM VIEW



WEBSTER-CHICAGO MODEL 100-621



Pin	12SJ7		50L6GT	
No.	Volt.	Res.	Volt.	Res.
1	0V.	220KΩ	0V.	Inf.
2	0V.	0Ω	62V AC	62Ω
3	2.5VDC	3.9KΩ	100VDC	†280Ω
4	0V.	50Ω	95VDC	†4KΩ
5	2.5VDC	3.9KΩ	.3VDC	500KΩ
6	55VDC	†335KΩ	.7VDC	14Ω
7	12VAC	12Ω	12VAC	12Ω
8	35VDC	†120KΩ	7.3VDC	165Ω

Pin	35Z5GT	
No.	Volt.	Res.
1	105VDC	†100Ω
2	117VAC	225Ω
3	107VAC	215Ω
4	95VDC	†4KΩ
5	105VAC	245Ω
6	65VDC	†19KΩ
7	80VAC	195Ω
8	110VDC	35KΩ

† MEASURED FROM PIN 8 OF V3.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

Figure 1

GENERAL INFORMATION

The Webster-Chicago Wire Recorder Mechanism consists of a complete wire transporting mechanism using a triple-purpose recording head which records, erases and plays back a recording.

The Model 178 has the following features:

1. An elapsed Time Indicator calibrated in 5-minute and 1-minute intervals.
2. A removable takeup spool to permit the recording of programs longer than one hour. A new spool of wire and takeup spool can be placed in position in just a few seconds' time.
3. Automatic stops in both directions. The stop shuts off the amplifier as well as the wire transporting mechanism.

The Webster 178 is designed to operate on 105-120 volts AC.

Manufactured by:

Webster-Chicago Corporation
5610 Bloomingdale Avenue
Chicago 39, Illinois

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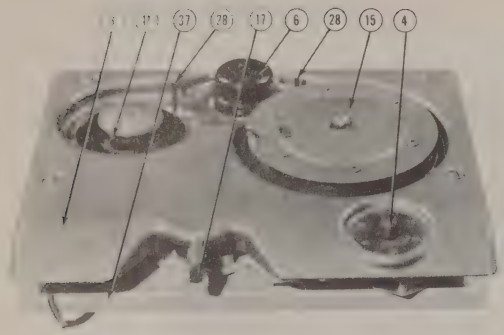


Figure 2

OPERATION

Making a Recording -

1. Place the recorder on a level table in order that the drive pulleys and brakes will operate properly.

2. Connect the power cord to an outlet supplying 105-120 volts ac.

3. Place a spool of wire on the supply chuck (11). The spool should be placed label-side up so that the wire will feed from the rear of the spool.

4. Rotate the takeup spool (15), by hand, until the recording head (6) reaches the top of its vertical travel.

5. Pull the loose end of the wire past the recording head, through the groove in the takeup spool cover (12), and under the clip on this cover with a little to spare. The clip may be loosened to permit the wire to slip under it by pressing on the button in the center of the takeup spool cover.

CAUTION: Before making a recording on a new spool of wire, it is advisable to run the entire spool through the recorder once and rewind it. This is advisable for two reasons:

(a) The wire will then be wound on the spool in direct relation to the rise and fall of the recording head.

(b) The rewound spool will be somewhat more loosely wound and the free end may "tuck in" more securely.

This operation may be performed with the Record-Listen switch (M2) push buttons in either position.

6. To record from "Mike," press Record Button 1. To record for radio, press Record Button 2. Press down on the control limiting button and move the control lever (17) to "Run" position. The limiting buttons are provided to prevent moving the control lever past "Stop" position when changing from either "Run" or "Rewind" position. The brakes are arranged so that a heavy brake is applied to the trailing spool when the control lever is moved to "Stop" position. This prevents wire spilling, which would otherwise occur due to the inertia of the spools. If the control lever is moved past the "Stop" position, the wire is almost certain to spill since the brake will be removed, allowing the spool to spin freely.

7. Rotate the clock-pointer (4) to the position marked "60." This indicates the start of the recording.

8. Adjust the volume control, Figure 1, until the needle of the indicator moves in the area marked "Normal." If the volume control setting during "Record" is too low, the background noise will be unduly high during "Listen." A volume control setting too high, while recording, will cause distortion, just as will an attempt to get too much output from a radio receiver. Also, it is possible, with the volume control turned full on, to saturate the wire to such an extent that it cannot be erased by ordinary means. If this should happen, the wire can be cleaned by using a "wire conditioner," which is a small, but powerful, magnet. This magnet may be attached to the recording head to erase wire passing it in either direction.

After the recording is completed, the control lever (17) should be moved to "Stop." Note the time of the clock indicator. Each recording should be logged. This is helpful in finding the start of a particular recording on the wire when rewinding.

To Rewind -

The rewind speed is about seven times the speed in the forward direction. In order to rewind the wire, press the limiting button and turn the control lever (17) to rewind. If a particular recording is to be played, note the clock indicator reading at the start of the recording. Rewind the wire to this reading and turn the control lever (17) to the stop position. If the wire is allowed to run completely off the takeup spool, the tension of the clip will cause the last turn to tuck into the supply spool and prevent unraveling.

Playback -

For playback, the wire is threaded exactly as for recording. Press push-button No. 3, depress the limiting button and turn the control lever (17) to "Run." The volume and tone controls may be adjusted to suit the listener. Playing a magnetic recording has no effect on the record, so a record can be played many times with no appreciable effect on its volume or quality. On the other hand, since the process of recording makes no mechanical change in the wire, a given wire can be erased and reused for new recordings as often as desired.

Erase -

If it becomes desirable to erase a record without, at the same time, placing a new record on the wire, the wire may be run through in the "Run" direction with the volume control turned to minimum and the "Record" button depressed. It is impossible to accidentally erase a record in the "Rewind" position, since the contacts on assembly (49) automatically open the erase circuit except in "Run" position.

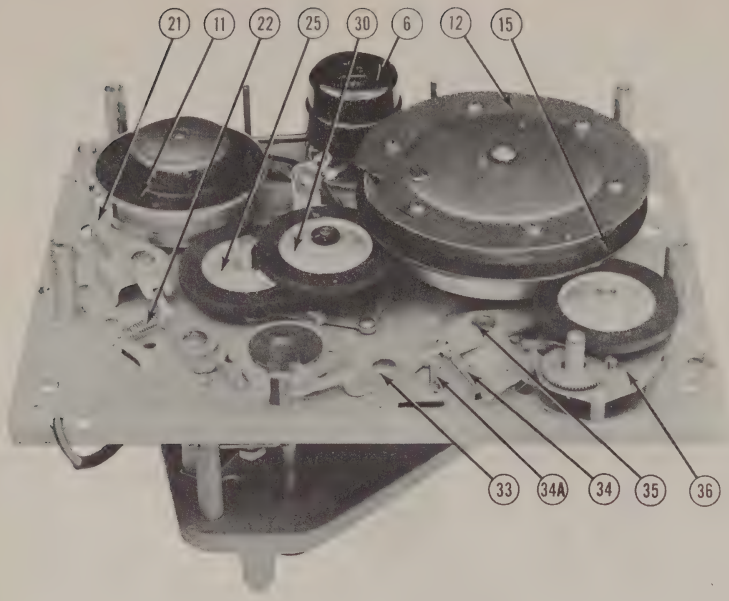


Figure 3

ADJUSTMENTS

Spools and Head - Height Adjustment -

The height of the takeup spool (15) and supply spool (11) is adjusted by loosening the lock nuts (56) and turning the set screws (57). In early models, these adjustments must be made after the mechanism has been installed in the cabinet, since the mechanism is usually warped, to some extent, when fastened to the cabinet. This warping will not affect the operation except to change the height of the spools. Holes are provided in the bottom of the cabinet to facilitate making the final adjustments. A preliminary adjustment should be made before the mechanism is installed, since the height of the head is not adjustable in the cabinet. On later models, having a rigid frame, the complete adjustment may be made with the mechanism out of the cabinet. The takeup spool (15) should be adjusted first. The upper edge of the lower flange of this spool should be adjusted flush, or not more than 1/32" above the flange of the top cover assembly (3). If the adjustment is too high, it is possible for the wire to pass under the flange and pile up on the underside of the spool. If the adjustment is too low, the wire will not wind all the way to the flange and a tangle could result.

The recording head should next be adjusted to level wind the wire on to the takeup spool. This adjustment is made by means of the spring-loaded adjustment screw (58), Figure (4), on the slide and socket assembly (16). Improper adjustment is indicated by a tendency for the wire to pile up at one end of the spool.

After the takeup spool and the head have been adjusted, the supply spool (11) should be adjusted so that the head will level wind the wire properly on it during "Rewind." The collars (59), Figure (4), should fit over the slots in the shafts and should not touch the bearings; they should always allow some end play in the shafts.

Brakes -

With the power off, move the motor control lever (17) to "Rewind," and force it slightly beyond its normal position. In this position, both brakes should be released and the spools should be free to spin. Check also by moving past the "Run" position in the same way.

Supply Spool Brake -

When the motor control is moved from "Stop" to its normal "Run" position, a light brake should be applied to the supply spool (11). The brake tension should be such that a pull of 1/2 to 5/8 ounces is required to pull wire from a nearly empty spool. In this position, the upright flange of the left brake lever (23) should be approximately centered in the slot of the left brake shoe assembly (21). Adjustment may be made, if necessary, by bending the brake lever (23). Assuming that the brake lever is not touching the brake shoe assembly, improper brake pressure may be remedied by bending the base plate lug to which the tension spring (20) is attached.

The purpose of this brake is to prevent spilling of the wire, which would happen if the supply spool should run faster than the takeup spool. Insufficient tension on the brake would be indicated by a tendency for the wire to "spill" in "Run" position. Too much tension may cause the motor to run slowly and unevenly resulting in poor recordings.

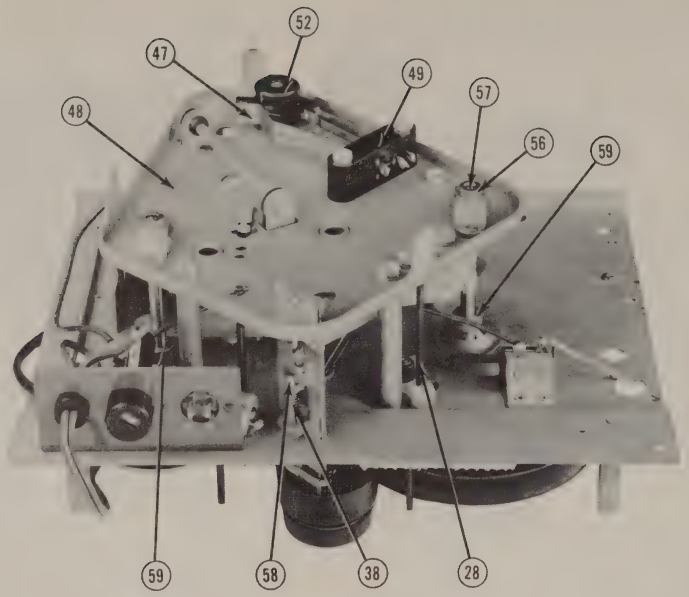


Figure 4

Takeup Spool Brake -

With the motor control moved to "Rewind," a light brake should be applied to the takeup spool. The brake tension should be such that a pull of 5/16 to 7/16 ounce is required to pull wire from the takeup spool when the head is on its downward stroke. Adjustment is made by bending the base plate lug to which the tension spring (20) is attached. Before making this adjustment, check to see that the upright flange of the right brake lever (33) is approximately centered in the slot of the right brake shoe assembly (35).

If the brake tension is too light, the wire may have a tendency to "spill" in "Rewind" position. Too much tension will cause the wire to wind so tightly on the supply spool that "tucking" will not occur when the wire pulls out of the clip at the end of the rewind operation.

Stopping Brakes -

When the motor control is moved from either operating position to "Stop," a heavy brake should be applied to the trailing spool. This stops the wire quickly and prevents spilling when power is removed from the driven spool. The brake cams (29 and 26) are so arranged that during operation a light brake is always applied to the spool from which wire is being removed, and a heavy brake is always applied to this spool when the motor control lever is moved to "Stop" position. The heavy brakes are controlled by the tension springs (22) acting through the brake levers (33) and (23).

Motor Drive Tension -

With the motor control lever in "Run" position, the motor shaft should press against the idler wheel (30) with a tension of from 7 to 9 ounces. This adjustment may be made by bending the lug on the motor plate to which the tension spring (42) is attached. Unless a special tool is used, it is necessary to remove the motor and make this adjustment by trial and error. A simple tool for adjusting this tension, without disassembling the mechanism, may be made by filing a slot near the end of a rectangular metal bar to fit over the adjustment lug.

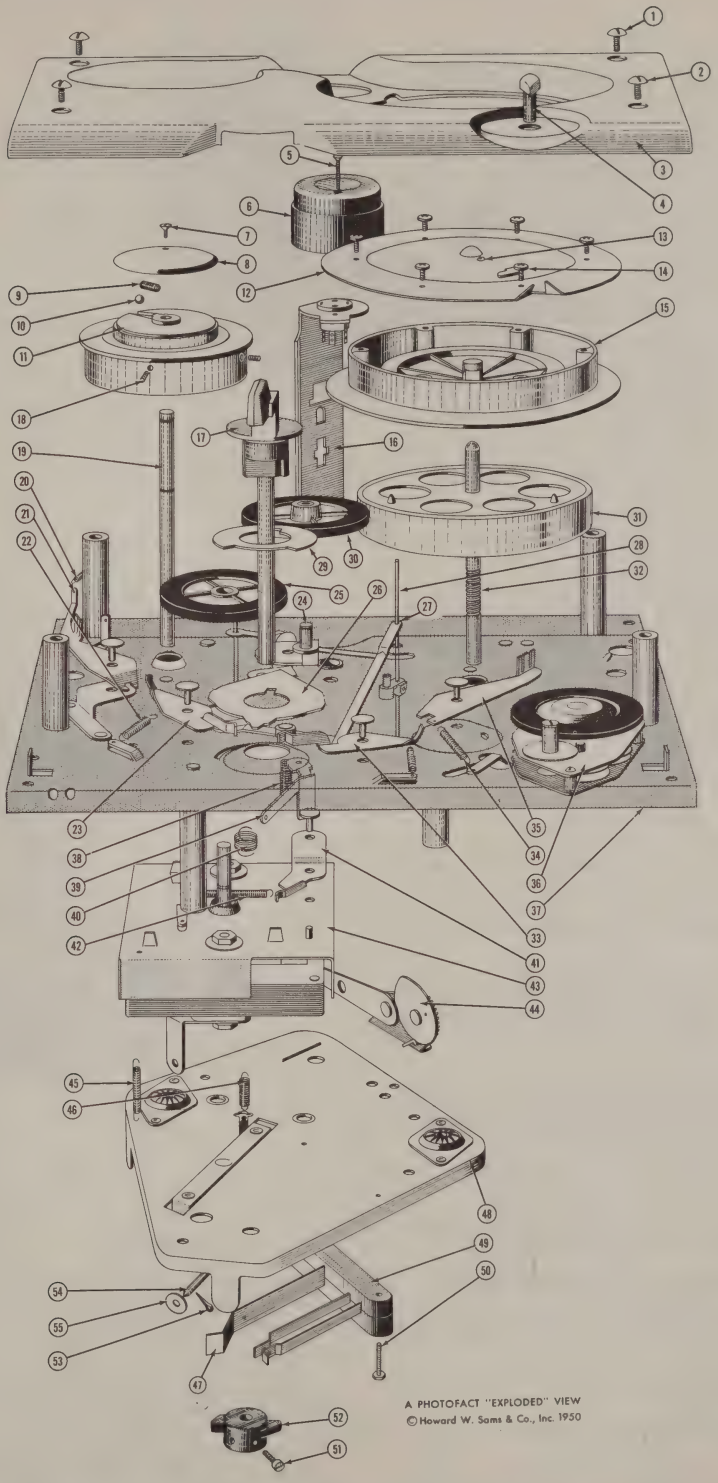
With the motor control lever in "Rewind" position, the drive wheel (25) should press against the supply spool (11) with a tension of from 2 to 3 ounces. In this position, there should be no tendency toward "motor bounce." Adjustment may be made by bending the sub-base lug to which the tension spring (46) is attached.

Cam and Rocker Arm Assembly -

The small end of the rocker arm (44) should be centered in the slot of the slide (16). At the same time, the cam gear should engage the worm with an appreciable amount of backlash, and the cam itself should not touch the worm. The mounting holes for the cam and rocker arm assembly are made large enough to permit adjustment in any direction merely by loosening the mounting screws.

Wire Clip -

The wire clip on the takeup spool cover (12) is provided to give a little "jerk" as the last turn of wire leaves the spool during "Rewind." This jerk causes the last turn to tuck into the lower layers of wire on the supply spool and prevent unraveling. If the spring tension on the clip is too weak, this tucking will not take place. Too much tension may cause consistent breaking of the wire at the end of the rewind operation. Occasional breaking at the clip is



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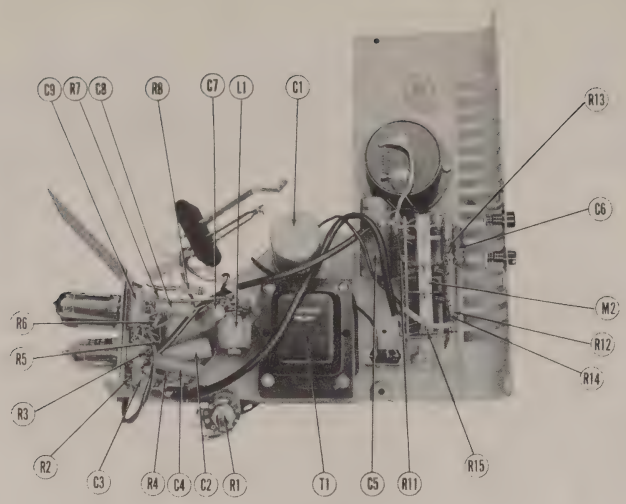


Figure 5

normal, due to kinking near the end of the wire. Since only a fraction of a second of recording time is lost with each break, no harm is done.

The tension of the clip is adjusted by turning the clip tension screw (13). For this purpose, it will be necessary to remove the cover (12). The tension should be adjusted so that a pressure of 17 oz. is required on the center button to allow a piece of wire to slip freely from under the clip.

LUBRICATION

Use a grease, such as Lubriplate, at the following points:

1. Sliding surfaces of slide and socket assembly (16).

2. Sliding surfaces of brake cams (29 and 26) and motor control lever (17). Be sure to grease the edges of the cams where they rub against the brake lever (33 and 26).

3. Pivots of brake control levers (33 and 26), and brake shoe assemblies (21 and 35). Do not use grease in the slots of the brake shoe assemblies.

4. Under the idler lever assembly (24).

5. On the worm shaft (32) where it contacts the gear of the rocker and cam assembly (44).

6. On the outside edge of the cam (44).

7. On the rubbing surfaces of the switch cam (52).

Use light oil at the following points:

1. Idler (30) bearing on felt washer.

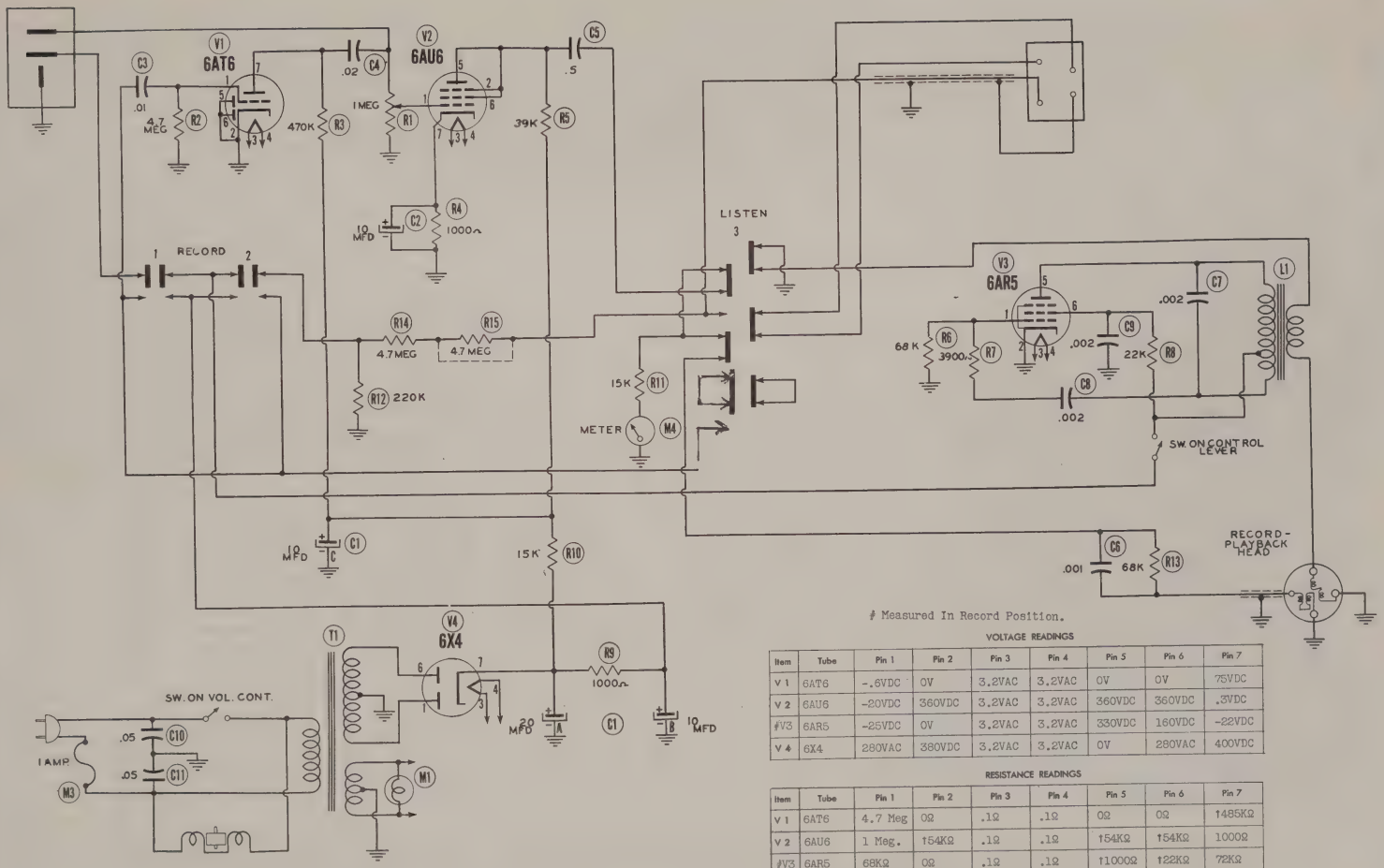
2. On the self-aligning bearings of shafts (19 and 32).

Figure 6

3. Motor bearings.

4. If new brake shoe assemblies (21 and 35) are installed, apply one drop of light oil to each felt. Otherwise, do not oil these felts.

Be very careful not to allow oil or grease to touch the rubber surfaces of the drive wheel (65) or the idler wheel (60). Any lubricant on these surfaces should be immediately removed with carbon tetrachloride. Excess lubricant on the brake felts will cause an oil surface on the supply or takeup spools. Such oil should be removed with carbon tetrachloride.



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Measured In Record Position.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6AT6	-.6VDC	0V	3.2VAC	3.2VAC	0V	0V	75VDC
V 2	6AU6	-20VDC	360VDC	3.2VAC	3.2VAC	360VDC	360VDC	.3VDC
#V3	6AR5	-25VDC	0V	3.2VAC	3.2VAC	330VDC	160VDC	-22VDC
V 4	6X4	280VAC	380VDC	3.2VAC	3.2VAC	0V	280VAC	400VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6AT6	4.7 Meg	0Ω	.1Ω	.1Ω	0Ω	0Ω	†485KΩ
V 2	6AU6	1 Meg.	†54KΩ	.1Ω	.1Ω	†54KΩ	†54KΩ	1000Ω
#V3	6AR5	68KΩ	0Ω	.1Ω	.1Ω	†1000Ω	†22KΩ	72KΩ
V 4	6X4	230Ω	260KΩ	.1Ω	.1Ω	Inf.	250Ω	260KΩ

† Measured From Pin 7 Of V4.

MECHANICAL

Ref. No.	Part No.	Description
1	26P826	Top Cover Mounting Screw
2	26P826	Top Cover Mounting Screw
3	45P725	Top Cover
4	49X106	Clock Pointer
5	26P764	Recorder Head Mounting Screws
6	11X380	Recorder Head
7	26P827	Chuck Cap Mounting Screws
8	45P492	Chuck Cap
9	46P142	Compression Spring
10	48P014	Supply Spool Retaining Ball
11	42P192	Supply Spool Chuck
12	11X181	Takeup Spool Cover
13	26P305	Wire Clip Tension Screw
14	26P804	Drum Cover Mounting Screw
15	11X346	Takeup Spool - Removable
16	11X208	Slide and Socket Assembly
17	42X195	Control Lever
18	26P633	Chuck Mounting Screw
19	41P618	Supply Spool Chuck Shaft
20	46P130	Tension Spring Supply Spool Light Brake
21	11X341	Left Brake Shoe Assembly
22	46P131	Heavy Brake Tension Spring
23	45P719	Left Brake Lever Cam Follower
24	11X179	Idler Lever Assembly
25	11X195	Drive Wheel Assembly
26	45P720	Reset and Brake Release Cam
27	11X342	Motor Shut-off Link - Long
28	41P623	Motor Shut-off Crank
29	45P495	Light Brake Cam
30	11X366	Idler Wheel Assembly
31	11X344	Takeup Drum
32	47P030	Takeup Drum Shaft
33	45P521	Right Brake Lever Cam Follower
34	46P145	Light Brake Tension Spring - Right
34A	46P131	Heavy Brake Tension Spring
35	11X247	Right Brake Shoe Assembly
36	11X357	"Clock" Gear Train (complete with drive wheel)
	46P165	"Clock" to Drum Tension Spring
37	11X340	Sub-Base Assembly
38	46P135	Head Stroke Adjusting Spring
39	45P544	Head Stroke Adjusting Bracket
40	46P132	Head Slide Tension Spring
41	45P493	Yoke
42	46P182	Motor Pressure Tension Spring
43	15X093	Motor Assembly
44	11X345	Cam and Rocker Assembly
45	46P183	Motor Pressure Tension Spring
46	46P183	Motor Pressure Tension Spring
47	45P728	Detent Spring
48	11X338	Bottom Plate Assembly
49	49P060	Contact Base
	11X176	Switch Leaf
	11X339	Switch Leaf
50	26P285	Switch Mounting Screws
51	26P079	Switch Cam Mounting Screw
52	49P105	R. F. Bias Switch Cam
53		Cotter Pin
54	41P617	Motor Pivot Pin
55		Washer
56	26P077	Spool Height Adjusting Lock Nut
57	41X591	Spool Height Adjusting Screw Assembly
58	26P284	Head Stroke Adjusting Screw
59	41P577	Thrust Collar

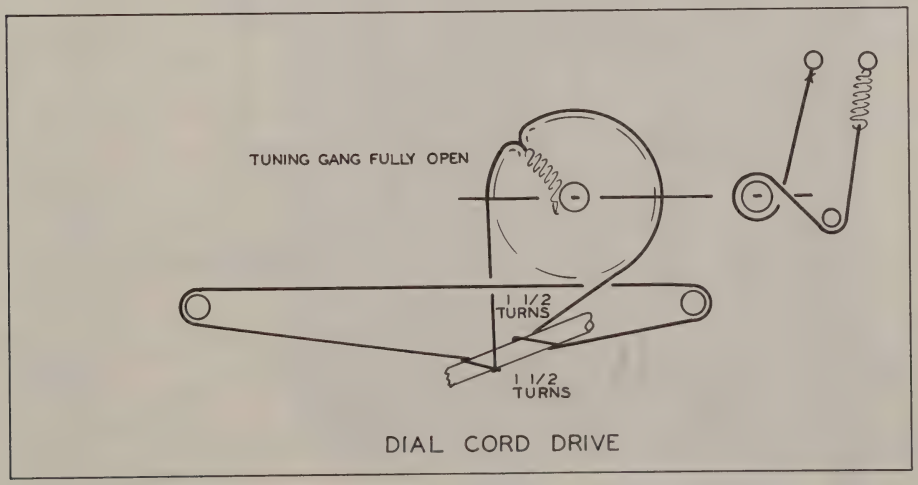
ELECTRICAL

Item No.	Use and Description
V1	Preamplifier, 6AT6
V2	Audio Output, 6AU6
V3	Oscillator, 6AR5
V4	Rectifier, 6X4
C1A	Filter (Electrolytic) 20 MFD. @ 450 V.
C1B	Filter (Electrolytic) 10 MFD. @ 450V.
C1C	Filter (Electrolytic) 10 MFD. @ 350 V.
C2	Output Cathode Bypass (Electrolytic) 10 MFD. @ 25 V.
C3	Audio Coupling, .01 MFD. @ 100 V.
C4	Audio Coupling, .02 MFD. @ 400 V.
C5	Audio Coupling, .5 MFD. @ 400 V.
C6	Tone Compensation, .001 MFD. @ 600 V.
C7	Fixer Trimmer, .002 MFD. @ 600 V.
C8	Bias Oscillator Grid Cap., .002 MFD. @ 600 V.
C9	Bias Oscillator Screen Bypass, .002 MFD. @ 600 V.
C10	Line Filter, .05 MFD. @ 400 V.
C11	Line Filter, .05 MFD. @ 400 V.
R1	Volume Control and Switch, 1 Meg.
R2	Preamp. Grid, 4.7 Meg., 1/2 Watt
R3	Preamp., Plate, 470K Ohm, 1/2 Watt
R4	Output Cathode, 1000 Ohm, 1/2 Watt
R5	Output Plate, 39K Ohm, 1/2 Watt
R6	Oscillator Grid, 68K Ohm, 1/2 Watt
R7	Oscillator Feedback, 3900 Ohm, 1/2 Watt
R8	Oscillator Screen, 22K Ohm, 1 Watt
R9	Filter, 1000 Ohm, 2 Watt
R10	Filter, 15K Ohm, 1/2 Watt
R11	Multiplier, 15K Ohm, 1/2 Watt
R12	Voltage Divider, 200K Ohm, 1/2 Watt
R13	Tone Compensation, 68K Ohm, 1/2 Watt
R14	Voltage Divider, 4.7 Meg., 1/2 Watt
R15	Voltage Divider, 4.7 Meg., 1/2 Watt
T1	Power Transformer
L1	Oscillator Coil
M1	Pilot Light (Type #51)
M2	Listen-Record Switch
M3	Fuse (1 Amp.)
M4	Meter (Record Level)

WESTINGHOUSE MODELS H-324T7, U,
H-325T7, U (Ch. V-2136,-2)

WESTINGHOUSE MODEL H-324T7U

TRADE NAME	Westinghouse, Models H-324T7 (Ch. V-2136-2), H-324T7U (Ch. V-2136), H-325T7 (Ch. V-2136-2), H-325T7U (Ch. V-2136)	
MANUFACTURER	Westinghouse Electric Corp., Home Radio Div., Sunbury, Pa.	
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver with Loop Antenna	
TUBES (SEVEN)	Types 12AT7 FM RF Amp.-Mixer, 12BE6 FM Osc.-AM Conv., 12BA6 1st IF Amp., 6BJ6 2nd FM IF Amp., 12AL5 Ratio Det., 12AU6 AM DET-AVC-AF, 50C5 Power Output.	
POWER SUPPLY	110-120 Volts AC-DC	RATING .30 Amp. at 117 Volts AC
TUNING RANGE-BROADCAST	540-1615KC	FREQ. MOD. 88-108MC



DIAL CORD DRIVE

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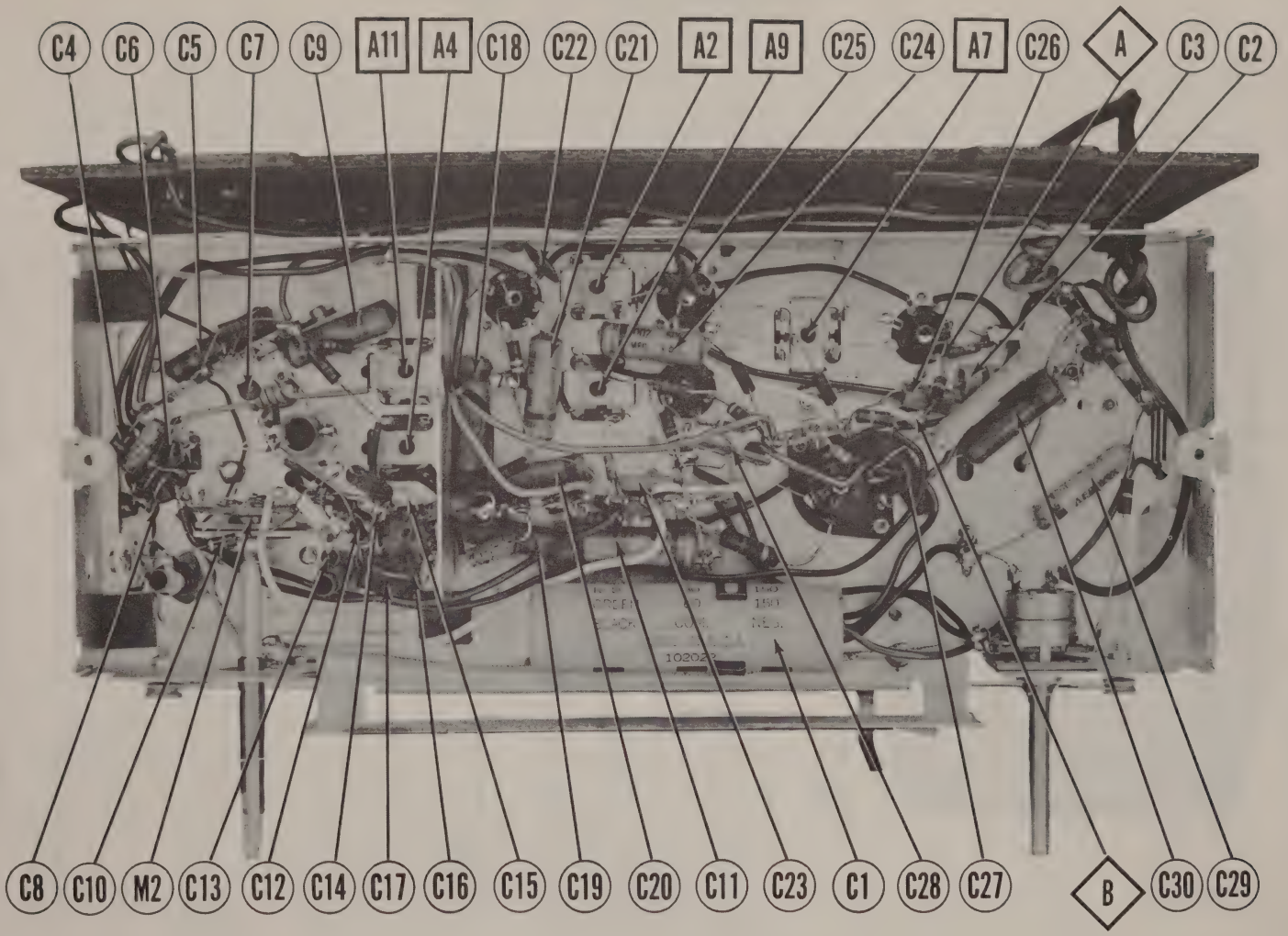
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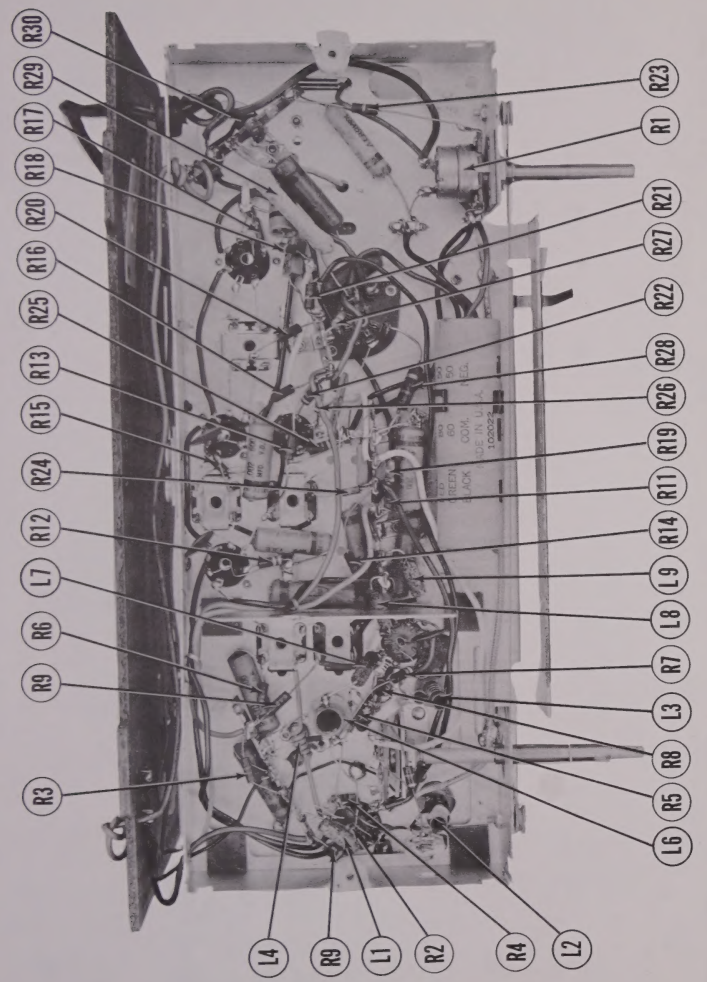

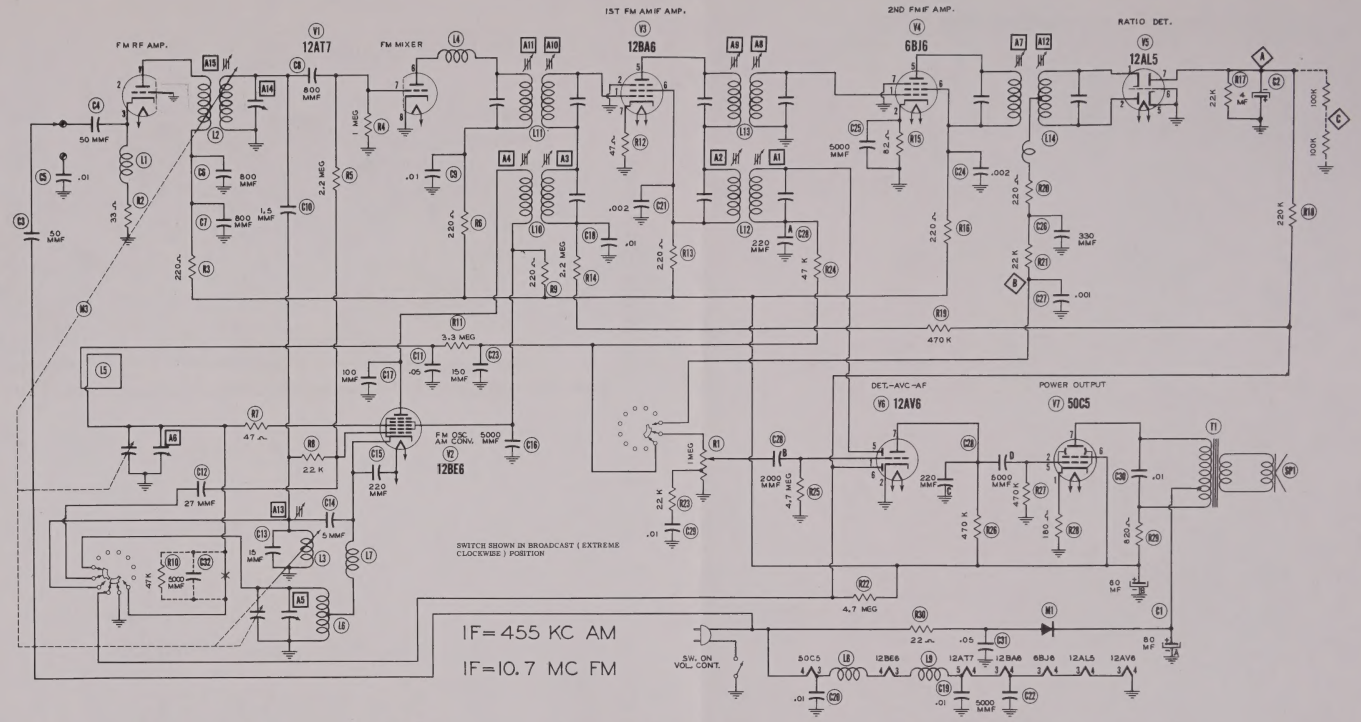

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	90VDC	0V.	.2VDC	42VAC	55VAC	90VDC	†-1.2VDC ▲-.6VDC	0V.	50VAC
V 2	12BE6	§†-3.5VDC §▲-5.8VDC	0V.	55VAC	65VAC	90VDC	90VDC	†0V ▲-.3VDC		
V 3	12BA6	-.2VDC	0V.	42VAC	30VAC	90VDC	90VDC	.8VDC		
V 4	6BJ6	80V.	§.8VDC	30VAC	25VAC	190VDC	190VDC	0V.		
V 5	12AL5	†-.4VDC	†-.4VDC	25VAC	13VAC	0V.	0V.	†-1.6VDC		
V 6	12AV6	-.6VDC	0V.	13VAC	0V.	†-.4VDC ▲-.3VDC	†-.3VDC ▲0V.	45VDC		
V 7	50C5	6.2VDC	0V.	85VAC	117VAC	0V.	90VDC	115VDC		

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	†1000Ω	0Ω	34Ω	42Ω	54Ω	†1000Ω	850KΩ ▲0Ω	0Ω	47Ω
V 2	12BE6	22KΩ	1.9Ω	55Ω	64Ω	†1000Ω	†1000Ω	† 47Ω ▲3.3Meg.		
V 3	12BA6	§2.8 Meg. ▲2.5 Meg.	0Ω	42Ω	30Ω	†1000Ω	†1000Ω	47Ω		
V 4	6BJ6	1.6Ω	82Ω	30Ω	24Ω	†1000Ω	†1000Ω	0Ω		
V 5	12AL5	† 1 Meg. ▲ Inf.	† 1 Meg. ▲ Inf.	24Ω	12Ω	0Ω ▲0Ω		†22KΩ ▲20KΩ		
V 6	12AV6	4.7 Meg.	0Ω	12Ω	0Ω	†680KΩ ▲380KΩ	†250KΩ ▲0Ω	†470KΩ		
V 7	50C5	180Ω	470KΩ	65Ω	115Ω	470KΩ	183ΩΩ	†235Ω		

† TAKEN IN "FM" POSITION.
▲ TAKEN IN "AM" POSITION.

† MEASURED FROM OUTPUT OF M1.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and chassis.

AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (Grid) of 12BE6 (V2). Low side to chassis.	455KC (400 ~ Mod.)	AM (CW)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .00MFD to reduce hum modulation.
2.		Loop	1615KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	"	Tune for max. output	"	A6	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (± 1%) resistors in series from Point A to chassis. The junction of these two resistors is alignment Point B as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 7 (Grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Unmod.)	FM (CCW)	Tuning gang fully open	DC Probe to Point A. Common to chassis.	A7, A8, A9, A10, All	Adjust for maximum deflection. Attenuate signal generator to maintain a maximum 2 volts reading.
5.	.01MFD	"	"	"	"	DC Probe to Point B. Common to Point A.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 % modulation and 450KC sweep. Use 120 % sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 7 (Grid) of 12AT7 (V1). Low side to chassis.	10.7MC (450KC SWP)	FM (CCW)	Tuning gang fully open	Vert. Amp. to Point A. Low side to chassis.	A7, A8, A9, A10, All	Disconnect stabilizer capacitor from C2. Adjust for maximum amplitude and symmetry as per figure 1.
5.	.01MFD	"	"	"	"	Vert. Amp. to Point B. Low side to chassis.	A12	Reconnect capacitor C2. Adjust A12 to place 10.7MC at center of crossover lines as per figure 2. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	300Ω carbon res.	High side thru 300Ω to "FM" antenna terminal. Low side to chassis.	98MC (Unmod.)	FM (CCW)	98MC	DC Probe to Point A. Common to chassis.	A13, A14	Adjust for maximum deflection.
7.	"	"	105MC	"	Tune for max. output	"	A15	"
8.	"	"	90MC	"	"	"	A14	Adjust for maximum deflection while rocking tuning gang. Repeat steps 7 and 8 until no further improvement can be made.

FIG. 1

FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA WESTINGHOUSE PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	BASE TYPE	INSTALLATION NOTES
V1	FM RF Amp.-FM Converter	12AT7	12AT7	9A	
V2	FM Osc.-AM Converter	12BE6	12BE6	7CH	
V3	1st IF Amp.	12AU6	12AU6	7CM	
V4	2nd FM IF Amp.	6BJ6	6BJ6	7CM	
V5	Ratio Det., AVC-AF	12AL5	12AL5	6BT	
V6	Power Output	12AV6	12AV6	7BT	
		50C5	50C5	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA WESTINGHOUSE PART No.	REPLACEMENT DATA ARROW-HART PART No.	REPLACEMENT DATA CORNELL-DUBILIER PART No.	IDENTIFICATION CODES ERIE PART No.	IDENTIFICATION CODES SPRAGUE PART No.	IDENTIFICATION CODES INSTALLATION NOTES
C1A	80	150	P88351/80-150-P	40-20	EDL1A45		TVA-3455	Filter-Red
B	80	150	P88351/80/4	40-20				Filter-Green
C2	50	50	V-5658-1	SI50	DH-500	5W5Q5	GPHK-50	Line Ant. Coupling
C3	50	50	V-5658-1D	SI50	DH-500	5W5Q5	GPHK-50	Ant. Coupling
C4	.05	200	V-5658-1D	SI20	DD-503	5W5Q5	19CB	Ant. Coupling
C5	800	400	V-5658-1D203M	P488-01	DD-102	81J-001	19C1	FM RF Plate Dec. *
C6	800	400	V-9863-1	BPD-0008	DD-102	81J-001	19C1	FM RF Plate Dec. *
C7	800	400	V-9863-1	BPD-0008	DD-102	81J-001	19C1	FM RF Plate Dec. *
C8	800	400	V-9863-1	BPD-0008	DD-102	81J-001	19C1	FM RF Coupling
C9	.01	400	RCP10W4103M	P488-01	DE-103	81J-01	47M-SI	Mixer Plate Dec.
C10	1.5	300	RCP10W2503M	BII-3NPO	TC2-1.5	PTE5E5	2TM-S5	Osc. Coupling
C11	1.5	300	R2CC30J158J0D	SI27	TC2-1.5	PTE5E5	2TM-S5	Osc. Coupling
C12	27		R2CC30J278J0K	SI27	DE-270	5W5Q5	GPHK-27	Osc. Grid Cap.
C13	15		V-5658-1	SI15NPO	TC2-15	PTE5E5	GPHK-15	Fixed Trimmer
C14	9		R2CC30J090D	SI09NPO	TC2-9	5W5Q5	GPHK-9	Osc. Grid Cap.
C15	220		R5CC30Z2Y221M	SI220	DE-221	5W5T25	GP2K-220	RF Bypass
C16	1000	500	RCM30A102M	1499-0005	DE-102	5W5T25	GP2K-1000	Filament Bypass
C17	100	500	RCM30A101J	1499-0003	TC2-100	SR5T1	NPOM-100	Fixed Trimmer
C18	.01	400	RCP10W4103M	P488-01	DE-103	81J-01	47M-S1	AVC Filter
C19	.01	400	RCP10W4103M	P488-01	DE-103	81J-01	47M-S1	Filament Bypass
C20	.01	200	RCP10W2103M	P488-01	DE-103	81J-01	47M-S1	Filament Bypass
C21	.002	600	RCP10W6203M	P888-002	DE-202	PTE5D2	GP2M-002	1st IF Dec.
C22	1000	500	RCM30A102M	P888-001	DE-102	PTE5D2	GP2K-001	1st IF Dec.
C23	150	500	RCM30A151M	1488-00015	DH-101	5W5T15	GP2K-150	Diode RF Filter
C24	.002	600	RCP10W6203M	P888-002	DE-202	PTE5D2	GP2M-002	2nd IF Dec.
C25	1000	500	RCM30A102M	P888-001	DE-102	PTE5D2	GP2K-001	2nd IF Dec.
C26	330	500	RCM30A331M	1488-00035	DE-331	5W5T3	GP2K-330	Diode Load Cap. †
C27	.001	600	RCP10W6102M	P888-001	DE-103	PTE5D2	GP2L-001	De-emphasis
C28A	3000		V-9894-1	BPD-002	DD-302	5W5T25	GP2K-250	Audio Coupling
B	3000	250		BPD-002	DD-302	PTE5D2	81J-002	Audio Coupling
C	3000	250		BPD-005	DD-305	PTE5D2	GP2K-250	AF Amp. Plate
C29	.01	400	RCP10W2103M	P488-01	DE-103	5W5T25	34C3	Tone Comp.
C30	.01	400	RCP10W4103M	P488-01	DE-103	PTE5E5	47M-SI	Tone Comp.
C31	.01	400	RCP10W4103M	P488-01	DE-103	PTE5E5	47M-S1	Output Cathode
C32	5000		V-5596	BPD-005	DD-502	PTE5E5	81J-005	Filter-Wire Wound
C33	5000		V-5596	BPD-005	DD-502	PTE5E5	81J-005	29C1	Surge Limiter

* Some models use 1000MMF in this application.
† Some models use 2500MMF in this application.
‡ Used only in chassis V-2136.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA WESTING. PART No.	REPLACEMENT DATA IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	V-9873-1	Q31-1373	A2E-38	B7-72-8	Volume control-tapped at 330KΩ
B	1 Meg.		Not Req.	76-1	92-3	B7-72-8	Volume control-less tap
C	Switch		Not Req.		SWB	Not Req.	Attach to R1A per instructions

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA WESTINGHOUSE PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES	INSTALLATION NOTES
					FM RF Amp. Cathode	
R2	332		RC20AE331M		FM RF Amp. Plate Decoupling	
R3	220Ω		RC20AE221M	BTS-220	FM Mixer Grid	
R4	2.2 Meg.		RC20AE225M	BTS-2.2 Meg.	Osc. Feedback	
R5	2.2 Meg.		RC20AE225M	BTS-2.2 Meg.		
R6	220Ω		RC20AE221M		FM Mixer Plate Decoupling	
R7	22KΩ		RC20AE223K	BTS-22K	Osc. Parasitic Suppressor	
R8	22KΩ		RC20AE223M	BTS-22K	Osc. Grid	
R9	220Ω		RC20AE221M	BTS-220	AM Conv. Decoupling	
R10	330Ω		RC20AE331M	BTS-330	1st IF Amp. Cathode	
R11	3.3 Meg.		RC20AE335M	BTS-3.3 Meg.	AVC Network	
R12	220Ω		RC20AE221M		1st IF Amp. Decoupling	
R13	2.2 Meg.		RC20AE225M	BTS-2.2 Meg.	2nd FM IF Amp. Cathode	
R14	220Ω		RC20AE221M	BTS-220	2nd FM IF Amp. Decoupling	
R15	220Ω		RC20AE221M	BTS-220	Ratio Det. Diode Load	
R16	22KΩ		RC20AE223K	BTS-22K	AVC Network	
R17	220Ω		RC20AE221M	BTS-220	AVC Network	
R18	470KΩ		RC20AE474K	BTS-470K	AVC Network	
R19	220Ω		RC20AE221M	BTS-220	Balancing-See Note 2	
R20	220Ω		RC20AE221M	BTS-220	AVC Network	
R21	4.7 Meg.		RC20AE475M	BTS-4.7 Meg.	De-emphasis	
R22	4.7 Meg.		RC20AE475M	BTS-4.7 Meg.	Audio Load	
R23	22KΩ		RC20AE223M	BTS-22K	Tone Compensation	
R24	470KΩ		RC20AE474M	BTS-470K	AF Amp. Grid	
R25	4.7 Meg.		RC20AE475M	BTS-4.7 Meg.	AF Amp. Plate	
R26	470KΩ		RC20AE474M	BTS-470K	AF Amp. Plate	
R27	470KΩ		RC20AE474M	BTS-470K	Output Cathode	
R28	18KΩ		RC20AE183K	BTA-180	Filter-Wire Wound	
R29	820Ω		V-8864-10	‡ 37AA-800	Surge Limiter	
R30	470KΩ		RC20AE474K			

Note 1. Used in chassis V-2136 only.
Note 2. Some models use a 470Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	REPLACEMENT DATA WESTING. PART No.	DC RES. PRI.	DC RES. SEC.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	20000Ω	4.3Ω	V-9665	245Ω	8Ω	A-3930	A-3031	RO-3	
				8.5Ω	0.2Ω				

SPEAKER

ITEM No.	RATINGS FIELD	RATINGS FM	RATINGS V. C. IMP.	REPLACEMENT DATA WESTING. PART No.	REPLACEMENT DATA JENSEN PART No.	REPLACEMENT DATA QUAM PART No.	INSTALLATION NOTES
SP1	2.5W	4.7Ω	4.7Ω	V-9841-1	Mod. P12L-V	S2A1	
	CONE DIA.		9"				
SP2							

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	WESTINGHOUSE PART No.	MESSNER PART No.	IRC PART No.	NOTES
L1	FM Ant.	.8Ω		V-9899-1		CLA-1-2	1.2 microhenries
L2	FM RF	0Ω	0Ω	V-9874			
L3	FM Mixer	0Ω		V-9875			
L4	RF Choke	0Ω		V-4898-12			
L5	Loop Ant.	3.3Ω		V-9853			
L6	Mixer Ant.	1.6Ω		V-9854			
L7	RF Choke	.8Ω		V-9899-1	14-1073	CLA-1-2	1.2 microhenries
L8	FM Choke	.8Ω	16Ω	V-9899-1		CLA-1-2	1.2 microhenries
L9	1st FM IF	1.6Ω	1.6Ω	V-9898	16-6758	CLA-1-2	1.2 microhenries
L10	1st AM IF	1.6Ω	1.6Ω	V-9898-1	16-3497		
L11	1st FM IF	1.6Ω		V-9898-1	16-3497		
L12	2nd AM IF	1.6Ω	1.6Ω	V-9843	16-3497		
L13	2nd FM IF	1.6Ω					
L14	Ratio Det.	2.7Ω	4Ω	V-9838			
	Trimer						

CHASSIS—TOP VIEW

SET 113

FOLDER 13

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA WESTINGHOUSE PART No.	REPLACEMENT DATA SELENIUM PART No.	NOTES
M1	.07AADC	V-9840	NC-5	6M1

MISCELLANEOUS

ITEM No.	PART NAME	WESTINGHOUSE PART No.	NOTES
M2	Switch	V-9871-1	AM-FM
M3	3 Gang Var. Cap.	V-9871-2	(44-55MMF, 49-215MMF)
A14	Trimmer	V-1099-1	FM RF Adj.
	Chassis	V-1099-4	Black
	Cabinet	V-1099-3	Ivory
	Dial Pointer	V-9839-1	